

Studies in the genus *Acacia* (Leguminosae:Mimosoideae)—11. *Acacia* species of the Hamersley Range area, Western Australia

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Abstract

Maslin, B. R. Studies in the genus *Acacia* (Leguminosae:Mimosoideae)—11. *Acacia* species of the Hamersley Range area, Western Australia. Nuytsia 4(1): 61-103 (1982). Eight new *Acacia* species from the Hamersley Range area belonging to sections Phylloclineae (*A. cuspidifolia*, *A. marramamba*), Plurinerves (*A. arrecta*) and Juliflorae (*A. atkinsiana*, *A. dawsoniana*, *A. effusa*, *A. exilis*, *A. hamersleyensis*) are described and illustrated. A brief discussion is given on the Hamersley Range populations of the taxonomically complex species, *A. bivenosa* DC. and also on certain members of the *A. stowardii* species-group i.e. *A. adsurgens* Maiden et Blakely, *A. kempeana* F. Muell., *A. rhodophloia* Maslin and *A. stowardii* Maiden. A lectotype is selected for both *A. trachycarpa* E. Pritzl and *A. xiphophylla* E. Pritzl. *Acacia clementii* Maiden et Blakely is relegated to synonymy under *A. xiphophylla*, *A. clementii* Domin under *A. pyrifolia* DC. while *A. gonocarpa* var. *lasiocalyx* F. Muell. is provisionally referred to *A. trachycarpa*. A key is given to the 46 *Acacia* species recorded for the Hamersley Range area. Distribution analyses of these species shows the *Acacia* flora as comprising mainly a mixture of wide-ranging arid zone and subtropical species principally from sections Juliflorae (25 species) and Phylloclineae (14 species). Only 4 species are endemic to the area. The Hamersley Range area emerges as a region with a preponderance of recently-evolved species.

Introduction

Due to increased botanical activity in the Pilbara over recent years, a number of taxonomic matters relating to *Acacia* have been brought to my attention. In this paper 8 new species occurring in, but not necessarily restricted to, the Hamersley Range area are described and the taxonomy of a number of other taxa is discussed. In addition, a key to the 46 *Acacia* species currently recorded for the area is provided. Because of current interest in the phytogeography of the Western Australian flora, a distribution analysis of the Hamersley Range *Acacia* species is included.

The area covered by the present study comprises the Hamersley Plateau as defined by Beard (1975) and includes both the Hamersley and Ophthalmia ranges. This area lies within the Fortescue Botanical District (Beard, 1980) and is situated in the north-west of Western Australia in a region known generally as the Pilbara.

Although 46 species of *Acacia* are here recorded for the Hamersley Range area (Table 1), it is likely that future sampling will increase this number. This is because many areas are very rugged, difficult of access and consequently poorly-collected botanically.

The majority of specimens used in this account are housed at the Western Australian Herbarium (PERTH). A list of specimens examined in the preparation of new species descriptions is given at the end of the paper. All illustrations were made from dried herbarium material.

The species are arranged alphabetically except for *A. adsurgens*, *A. kempeana* and *A. rhodophloia* which are discussed under *A. stowardii*. The distribution of each species is indicated with respect to its occurrence within Beard's (1980) Botanical Districts. The 1:250 000 map references are also given so that distributions can be correlated with those listed in Hnatiuk and Maslin (1980) and Maslin and Pedley (in press).

The environment. A detailed description of the Pilbara region is given in Beard (1975) and summarized in Beard (1980). The brief notes on climate, geology/geomorphology and vegetation which follow, are largely taken from these two accounts.

The Hamersley Plateau has an arid-tropical climate with an annual precipitation of 250-300 mm. The climate is largely dominated by tropical cyclones which occur predominantly from January to March. Average temperatures for Wittenoom, situated on the north of the Plateau, range from about 18°C in June and July to about 33°C in the November-March period.

The Hamersley Plateau is a mountainous region lying between the Fortescue and Ashburton Rivers. It comprises massive deposits of Lower Proterozoic sediments (mainly jasperlite and dolomite) and volcanics overlying Archean granite and volcanics. On its northern flank the Plateau is bounded by an abrupt escarpment fronting the Fortescue Valley. Around Wittenoom, short rivers have cut deep, narrow gorges into the Plateau. When present, soils on the ranges are rocky and skeletal. Further south and east the topography is different and comprises broken country of impressive ranges separated by broad alluvial plains of deep, earthy loams. The highest eminence in Western Australia, Mt Meharry (1 235 m), occurs in this area.

The vegetation of the jasperlite and dolomite ranges is characteristically a tree steppe dominated by *Eucalyptus leucophloia* (snappy gum) with a *Triodia wiseana* (spinifex) ground cover. On basaltic hills, as in the Tom Price-Paraburdoo area, a vegetation mosaic of *Acacia aneura* (mulga) low woodland and *A. inaequilatera*-*Triodia* shrub steppe is found. Most of the valleys carry *A. aneura* low woodland.

Phytogeography of *Acacia* in the Hamersley Range area

Distribution maps of all species mentioned in this discussion are given in Maslin and Pedley (1982).

As discussed by Hopper and Maslin (1978) the Pilbara is one of the secondary centres of species richness for *Acacia* in Western Australia. Of the 54 species recorded for the Pilbara (Maslin and Hnatiuk, unpublished) 46 occur in the Hamersley Range area (Table 1). Only 4 species, *A. dawsoniana*, *A. effusa*, *A. exilis* and *A. hamersleyensis* are endemic.

The *Acacia* flora of the Hamersley Range area is dominated by sections Juliflorae (25 species) and Phyllodineae (14 species) which together comprise 84 per cent of the total. The remaining seven species are contained in sections *Acacia*, *Lycopodiifoliae* and *Plurinerves* (Table 2).

The main geographical affinities of the Hamersley Range area *Acacia* species are with arid zone and subtropical regions. This is evident from Tables 1 and 2 where it is seen that 33 species (72%) and 32 species (70%) are shared with the adjacent Central Eremean and South Kimberley Areas respectively (see Figure 1 for

Table 1. Alphabetic listing of *Acacia* species recorded for the Hamersley Range area showing the taxonomic section to which each belongs as well as their distribution. The distribution data is taken from Maslin and Pedley (1982).—Continued.

Species	Section (Pedley, 1978)	Distribution within the Hamersley Range area. ^A	Distribution outside the Hamersley Range area														
			W.A. ^B										Extra W.A. ^C				
			nk	sk	nwe	we	ne	ce	swe	se	cnw	swc					
<i>A. monticola</i> J. M. Black	Plurinerves	157,158,169			x		x										NT,Q
<i>A. orthocarpa</i> F. Muell.	Juliflorae	145,146,157	x		x												NT,Q
<i>A. pachyacta</i> Maiden et Blakely	Phyllodineae	156,157,158,169			x												NT,SA
<i>A. pruinocarpa</i> Tindale	Phyllodineae	157,158,168,169			x												NT,SA
<i>A. ptychophylla</i> F. Muell.	Juliflorae	157			x												NT,SA
<i>A. pyrifolia</i> DC.	Phyllodineae	145,146,156,157, 158,168,169	x		x												
<i>A. retivenia</i> F. Muell.	Plurinerves	157	x		x												NT,Q
<i>A. rhodophloia</i> Maslin	Juliflorae	157,158,168,169	x		x												NT
<i>A. sclerosperma</i> F. Muell.	Phyllodineae	145,146,156,157, 158,168,169	x		x												
<i>A. spondylophylla</i> F. Muell.	Lycopodiifoliae	157,158,169	x		x												NT,Q
<i>A. stowardii</i> Maiden	Juliflorae	157,158,169			x												NT,SA,Q,NSW
<i>A. tenuissima</i> F. Muell.	Juliflorae	157,158,169			x												NT,Q
<i>A. tenuissima</i> F. Muell. Juliflorae	145,146,157,158, 169		x		x												
<i>A. tetragonophylla</i> F. Muell.	Phyllodineae	157,158,168,169			x												NT,SA,Q,NSW
<i>A. trachycarpa</i> E. Pritzel	Juliflorae	145,146,156,157, 158			x												
<i>A. tumida</i> F. Muell. ex Benth.	Juliflorae	145,146,157,158	x		x												NT
<i>A. validinervia</i> Maiden et Blakely	Phyllodineae	157,158			x												NT,SA
<i>A. victoriae</i> Benth.	Phyllodineae	145,146,156,157, 158,168,169			x												NSW,V
<i>A. wanyu</i> Tindale	Juliflorae	145,156,168,169			x												
<i>A. xiphophylla</i> E. Pritzel	Juliflorae	145,146,156,157, 168			x												

*Although possessing 2-3-nerved phyllodes, I feel this species is better placed in section Phyllodineae than in section Plurinerves.

^AThe numbers appearing in this column refer to 1°x1.5° grid cells as shown in Hnatiuk and Maslin (1980).

^BAbbreviations used here are for Western Australian *Acacia* Areas as explained in Figure 1.

^CAustralian State abbreviations are as follows: NT—Northern Territory, NSW—New South Wales, Q—Queensland, SA—South Australia, V—Victoria.

Table 2. Results of geographical analysis of *Acacia* sections occurring in the Hamersley Range area. Distribution abbreviations refer to the *Acacia* Regions and Areas given in Figure 1.

Section (Pedley, 1978)	Number of <i>Acacia</i> species in the Hamersley Range area		Distribution of Hamersley Range <i>Acacia</i> species												
	Total No.	Endemic	KR		ER						SWR		Extra- W.A.		
			nk	sk	new	ne	ce	we	swe	se	swc	cnw			
Juliflorae	25	4	5	16	25	10	16	7	7	3	0	3	14		
Plurinerves	4	0	1	4	4	2	2	1	0	0	0	0	3		
Phyllodineae	14	0	2	9	14	6	12	8	8	5	0	2	9		
Lycopodiifoliae	2	0	1	2	2	2	2	0	0	0	0	0	2		
<i>Acacia</i>	1	0	1	1	1	0	1	1	1	0	0	0	1		
TOTALS	46	4	10	32	46	20	33	17	16	8	0	5	29		

definition of *Acacia* Areas referred to herein). Wide-ranging taxa from all sections of the genus contribute to these arid zone/subtropical affinities but most species are contained in the sections Juliflorae and Phyllodineae. For example, *A. aneura*, *A. cuthbertsonii*, *A. kempeana*, and *A. stowardii* (all section Juliflorae) and *A. dictyophleba*, *A. inaequilatera*, *A. maitlandii*, *A. pruinocarpa* and *A. tetragonophylla* (all section Phyllodineae) are common in the central and southern parts of the Australian arid zone. Most of these species find their western or north-western limit of distribution in the region of the Hamersley Range. The subtropical affinities are attributed mainly to species distributed in both the northern arid zone and in subtropical parts of northern Australia, e.g. *A. acradenia*, *A. ancistrocarpa*, *A. hilliana*, *A. tenuissima*, *A. tumida* (all section Juliflorae), *A. coriacea*, *A. monticola*, *A. retivenia* (all section Plurinerves) and *A. victoriae* (section Phyllodineae).

Based on current taxonomic knowledge, 44 of the 46 Hamersley Range area *Acacia* species have at least one known close relative and are therefore classified as being of recent origin according to the criteria adopted by Stebbins and Major (1965). Only *A. daweana* and *A. tetragonophylla* seem to qualify as possible relict taxa because neither is known to have taxonomically close relatives. The species richness of the Hamersley *Acacia* flora is therefore the result of an accumulation of recently derived taxa rather than through the persistence of numerous relict taxa. This accords with results shown for other areas of Western Australia (Hopper and Maslin, 1978).

Of the recently derived species, six are either restricted to the Hamersley Range area or extend only to nearby regions. These six species are listed here together with their closest relative(s) and it is to be noted that in every case, at least one of the close relatives also occurs within the Hamersley Range area.

1. *A. arrecta*/*A. abbreviata*, *A. arida*, *A. hilliana*, *A. minutifolia*, *A. orthocarpa*;
2. *A. atkinsiana*/*A. adsurgens*, *A. duriuscula*, *A. kempeana*, *A. nelsonii*, *A. rhodophloia*, *A. stowardii*;
3. *A. effusa*/*A. chisholmii*, *A. gracillima*, *A. lysiphloia*, *A. trachycarpa*;
4. *A. exilis*/*A. tenuissima*;
5. *A. hamersleyensis*/*A. citrinoviridis*, *A. tumida*, *A. xiphophylla*;
6. *A. marramamba*/*A. inaequilatera*, *A. pyrifolia*, *A. strongylophylla*.

Bowler (in press) proposed that areas peripheral to the central arid zone were climatically the most unpredictable regions of Australia during the Quaternary. According to Maslin and Hopper (in press), the resultant stresses placed on sedentary organisms in such regions created situations ideal for localized speciation. From the data given above it is evident that the Hamersley Range area has been one such region of speciation. It is intriguing to speculate why a number of the recently-evolved Hamersley Range species are confined to the nearby area. Perhaps, as suggested by Randell and Symon (1977), the formation of extensive sand dune systems some 30 000 years B.P. have played an important role as an isolating mechanism. Certainly the Hamersleys are "isolated" in the sense that they are bounded to the north and east by the Great Sandy Desert and the Little Sandy Desert and to the south by the Ashburton River sedimentary basin.

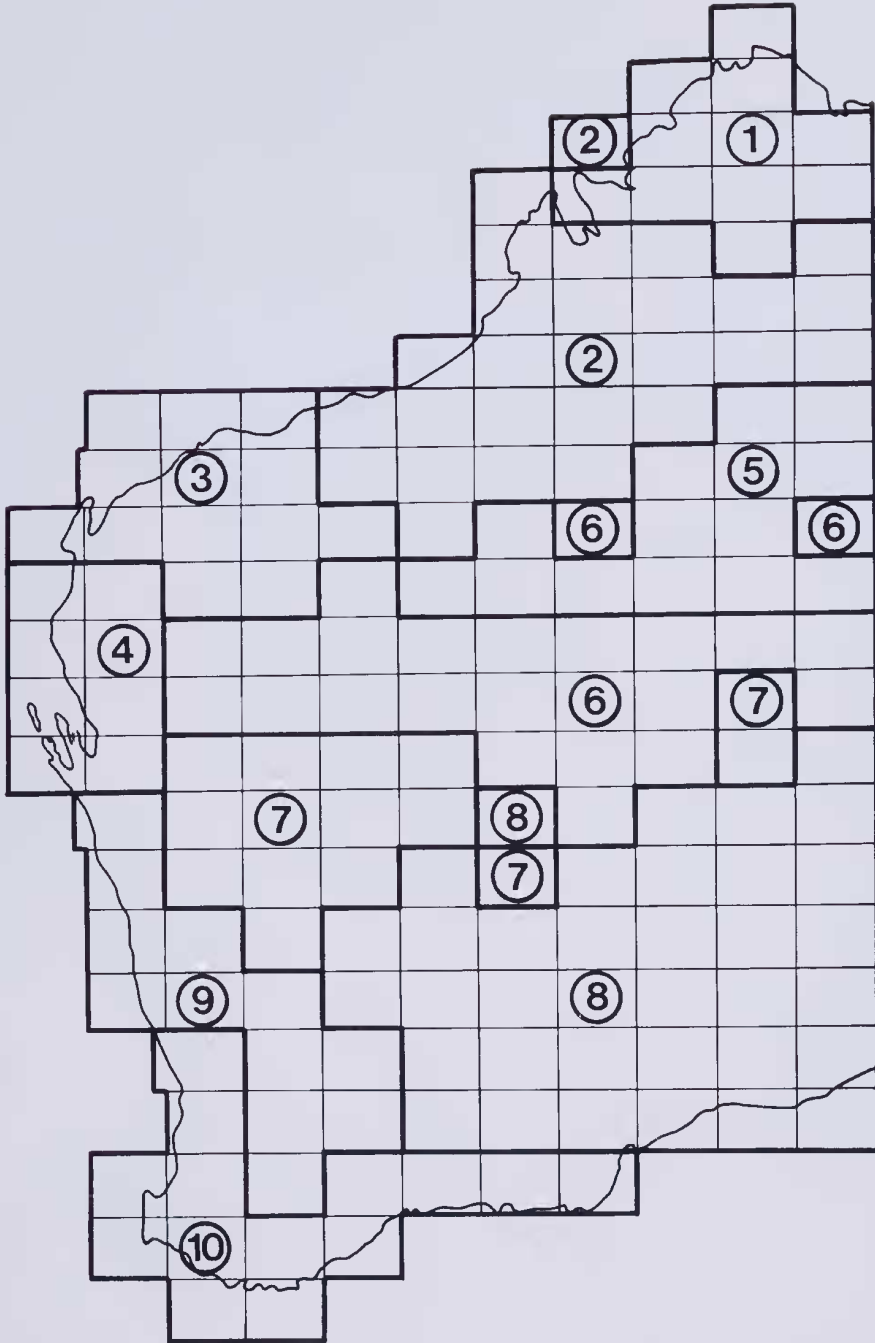


Figure 1. Map of Western Australia showing the ten Acacia Areas defined by Hnatiuk and Maslin (unpublished) based on $1^{\circ} \times 1.5^{\circ}$ grid cells.

1-2: Kimberley Region (KR) showing 1. North (nk) and 2. South (sk) Kimberley areas. 3-8: Eremaean Region (ER) showing 3. North-West (nwe), 4. West (we), 5. North (ne), 6. Central (ce), 7. South-West (swe) and 8. South (se) Eremaean areas. 9-10: South-West Region (SWR) showing 9. South and West Coastal (swc) and 10. Central and North Wheatbelt (cnw) areas.

Taxonomy

Key to the *Acacia* species of the Hamersley Range area

(Numbered species are described and/or discussed in the text. Descriptions for species marked with an asterisk (*) are in Maslin (1981)).

1. Foliage bipinnate; stipules spiny.....**A. farnesiana*
Foliage reduced to phyllodes.....2
2. Phyllodes with very sharp, spiny, needle-like tips; flower-heads globular.....3
Phyllodes not sharp and spiny (although sometimes the tips may be coarsely pungent, especially on terete phyllodes); flower-heads globular to cylindrical...8
3. Phyllodes 1-4 cm wide, elliptic but often asymmetrically so; stipules spiny, sometimes deciduous; inflorescences racemose or paniculate.....4
Phyllodes less than 1 cm wide, linear to narrowly oblong-elliptic or narrowly obovate; inflorescences simple and axillary (neither racemose nor paniculate)...6
4. Phyllodes symmetric with the midrib centrally situated, often glaucous; inflorescence axes yellowish or with a pale purplish tinge.....10. *A. pyrifolia*
Phyllodes asymmetric with the midrib situated near the lower margin.....5
5. Branchlet apices white-pruinose; phyllodes 2.5-7 cm long, 1.5-3.5 cm wide, often grey-green, reticulum prominent; inflorescence axes purple; bark corky; gnarled trees to c. 5 m tall.....**A. inaequilatera*
Branchlet apices not pruinose; phyllodes 2-4 cm long, 1-2 cm wide, pale green, reticulum obscure; inflorescence axes red-brown; bark fibrous; shrubby trees to 3(5) m tall.....9. *A. marramamba*
6. Phyllodes fasciculate (solitary on new shoots), acicular, c. 1 mm wide; diffuse shrubs or trees to 5 m tall.....**A. tetragonophylla*
Phyllodes scattered (not fasciculate), more than 1 mm wide.....7
7. Stipules spiny (although absent from some nodes); phyllodes normally 3-6 cm long; flower-heads pale yellow; bushy, non-resinous shrubs or trees 3-7 m tall.....4. *A. cuspidifolia*
Stipules not spiny, persistent, c. 1 mm long; phyllodes 0.8-2.5 cm long; flower-heads golden yellow; resinous, rather spindly and open shrubs 2-3 m tall.....**A. maitlandii*
8. Phyllodes whorled, to c. 1 cm long, \pm terete; legumes sticky; shrubs dense, spreading, to 1 m tall.....9
Phyllodes scattered, normally more than 1 cm long.....10
9. Phyllodes less than 5 mm long, ascending, grey; branchlets densely white-pilose; petals striate.....**A. adoxa* var. *adoxo*
Phyllodes more than 5 mm long, spreading (at maturity), bright green; Branchlets not conspicuously hairy; petals obscurely 1-nerved **A. spondylophylla*
10. Phyllodes minutely punctulate i.e. with minute, circular, whitish dots which are observable at x10 mag., nerveless or very obscurely nerved; flower-heads cylindrical; legumes woody, basally narrowed; seeds oblique with straight, narrowly turbinate funicle/arils.....11
Phyllodes not punctulate, nerves often conspicuous; flower-heads globular to cylindrical.....12
11. Phyllodes flat.....*A. arida*
Phyllodes terete (very closely allied to the above).....**A. orthocarpa*
12. Phyllodes terete, subterete or quadrangular.....13
Phyllodes distinctly flattened (although occasionally only 1-2 mm wide).....21
13. Longest phyllode less than 7 cm.....14
Longest phyllode more than 7 cm.....16

14. Flower-heads globular, on peduncles 1.5-4 cm long; legumes woody, vernicose when young, basally narrowed, 4-6 mm wide, margins not thickened; phyllodes to 4 cm long, curved upwards; slightly viscid, spreading shrubs to 1 m tall.....1. *A. arrecta*
Flower-heads cylindrical 15
15. Peduncles 1-3 cm long; phyllodes to 6 cm long, green; legumes woody, sticky (at least when young), linear but basally narrowed, c. 4 mm wide, margins thickened; resinous, spreading shrubs to 1 m tall..... **A. hilliana*
Peduncles to 1 cm long; phyllodes variable, grey-green; legumes papery, not sticky, \pm oblong, 4-15 mm wide; shrubs or trees more than 1 m tall... **A. aneura*
16. Flower-heads globular, arranged in axillary racemes; phyllodes 4-nerved in all, together with the branchlets always glabrous.....17
Flower-heads cylindrical spikes, simple and axillary (not racemose); phyllodes more than 4-nerved (nerves often very fine and obscure) 18
17. Legumes papery and flat; calyx divided into free, linear-spathulate sepals; branchlets red-brown; phyllodes finely filiform, c. 0.5 mm diam., \pm quadrangular, smooth..... **A. pachyacra*
Legumes woody and moniliform; calyx united, \pm truncate; branchlets light grey; phyllodes 1 mm or more wide, often distinctly flattened, coarsely wrinkled when dry *A. sclerosperma*
18. Branchlet apices and/or phyllodes (at least when young) hairy to some degree (hairs minute, appressed, and on phyllodes in *A. aneura* often confined to the region between the nerves: observe at x10 mag.)..... 19
Branchlet apices and phyllodes glabrous (neglect pulvinal area in *A. exilis*)... 20
19. Legumes woody and moniliform; young phyllodes not resinous, covered with a dense silvery or greenish yellow indumentum; sepals variably united for about half their length *A. wanyu*
Legumes papery and flat; young phyllodes resin-nerved, indumentum generally less conspicuous than above, mature phyllodes grey-green; sepals free to base **A. aneura*
20. Branchlet apices with yellow, crenulated, resin ribs (observe at x10 mag.); spikes dense, to c. 1 cm long, pale yellow; phyllodes 6-15 cm long; legumes 2-3 mm wide; shrubs normally to 2 m tall..... **A. tenuissima*
Branchlet apices without resin ribs; spikes not dense, 1-2 cm long, light golden; phyllodes 14-18 cm long; legumes 4-5 mm wide; tall shrubs or small trees to 4 m 7. *A. exilis*
21. Phyllodes with 1 longitudinal nerve on each face (nerve often obscure in *A. victoriae*, the phyllodes then finely wrinkled when dry) 22
Phyllodes with more than 1 longitudinal nerve on each face (nerves normally numerous, very fine and close together but sometimes few, conspicuous and widely spaced; in *A. bivenosa* nerves reduced to 2 with one of them poorly developed—best observed on dried specimens)..... 29
22. Flower-heads cylindrical (on fruiting specimens inspect receptacle for flower scars); bark "Minni Ritchi" i.e. reddish and exfoliating in narrow shavings which curl retrorsely from each end; legumes circinate, \pm reticulate, resinous..... 23
Flower-heads globular; bark not "Minni Ritchi" 24
23. Phyllodes asymmetrically elliptic, 9-15 mm long, 3-7 mm wide, apex rounded with an acute, laterally positioned, acute mucro; wide-spreading shrubs to 1 m tall..... 6. *A. effusa*
Phyllodes narrowly linear, longer and narrower than above; tall shrubs more than 1 m 12. *A. trachycarpa*

24. Phyllodes all less than 5 cm long 25
 Phyllodes some or all more than 5 cm long 26
25. Stipules spiny on young plants, often deciduous with age; branchlets not resinous, often pruinose; peduncles normally in pairs; phyllodes never spiny-tipped, often finely wrinkled when dry; shrubs or small trees **A. victoriae*
 Stipules not spiny, persistent, appressed, c. 1 mm long; branchlets resinous, never pruinose; peduncles solitary in phyllode axils; phyllodes normally spiny-tipped; rather spindly, open shrubs 2-3 m tall **A. maitlandii*
26. Phyllodes long and narrowly linear, less than 5 mm wide, normally terete but appearing flat when broad (see lead 17 above) *A. sclerosperma*
 Phyllodes more than 5 mm wide 27
27. Peduncles less than 1 cm long; phyllodes less than 10 cm long; attractive, fragrant shrubs to 3 m tall, commonly forming groves along roadsides, trunks white **A. validinervia*
 Peduncles more than 1 cm long; phyllodes normally more than 10 cm long . . . 28
28. Legumes \pm chartaceous, 10-17 mm wide; bracteole and sepal apices densely golden puberulous (best observed at x10 mag. on unexpanded heads); trees to 10 m tall, not confined to watercourses, flowering from October to December (heads bright golden) **A. pruinocarpa*
 Legumes \pm woody, c. 5 mm wide; bracteoles and sepals glabrous; bushy shrubs or trees confined to watercourses, flowering from May to August (heads white or cream) **A. ampliceps*
29. Phyllodes large (c. 10-20 cm long and 1-2.5 cm wide) AND the minor nerves forming a loose, open reticulum between the 2-4 main longitudinal nerves; flower-heads cylindrical 30
 Phyllodes shorter or narrower OR if not, then the minor nerves very fine, close together and parallel (nor forming a loose, open reticulum); flower-heads globular to cylindrical 31
30. Petals glabrous (best to observe unexpanded spikes); phyllodes \pm symmetrically and gently falcate **A. cowleana*
 Petals minutely sericeous; phyllodes \pm straight although normally curved near their apices, somewhat asymmetric **A. holosericea*
31. Flower-heads globular or obloid i.e. less than twice as long as wide (on fruiting specimens inspect receptacle for flower scars) 32
 Flower-heads distinctly cylindrical i.e. more than twice as long as wide 37
32. Phyllodes with numerous, very fine, parallel (never anastomosing) nerves which are situated close together 33
 Phyllodes with 2-5 widely spaced main longitudinal nerves between which the minor nerves frequently anastomose and form a reticulum 34
33. Flower-heads globular; legumes moniliform, to 23 cm long, 6-13 mm wide; phyllodes \pm linear, 12-35 cm long, 1-7 mm wide, lax and often pendulous; trees to 10 m tall and normally confined to watercourses **A. coriacea*
 Flower-heads obloid; legumes flat and broadly linear, to 10 cm long, 4-6 mm wide; phyllodes very narrowly elliptic to narrowly oblanceolate, 6-15 cm long, (4)5-10(12) mm wide, ascending; shrubs to 3.3 m tall, favouring open spinifex plains 2. *A. atkinsiana*
34. Branchlets and phyllodes hairy (sometimes the hairs are very fine—observe at x10 mag.); inflorescences normally not racemose 35
 Branchlets and phyllodes completely glabrous; bark never “Minni Ritchi”. . . 36

- 35. Phyllodes 3-7.5 cm long, 2-4 cm wide, strongly reticulate; indumentum conspicuous and densely tomentose; flower-heads large; open shrubs to 3 m tall, bark not "Minni Ritchi". **A. retivenia*
 Phyllodes 1.2-3 cm long, 5-15 mm wide, nerves of reticulum fine and impressed; indumentum finely puberulous, less conspicuous than above; shrubs or trees to 5 m tall, bark "Minni Ritchi" i.e. reddish brown and exfoliating in narrow shavings which curl retrorsely from each end. **A. monticola*
- 36. Inflorescences racemose but racemes normally grow out as leafy shoots with the peduncles then appearing axillary; phyllodes not conspicuously reticulate, fleshy, finely wrinkled when dry, with 2 longitudinal nerves (but one of these is poorly developed); legumes woody, less than 1 cm wide; shrubs not resinous. 3. *A. bivenosa*
 Inflorescences not racemose; phyllodes conspicuously reticulate, coriaceous, with 2-5 longitudinal nerves; legumes firmly chartaceous, 1-1.5 cm wide; shrubs resinous. **A. dictyophleba*
- 37. Phyllodes narrowly linear, 1-2 mm wide, not rigid, 1-3 longitudinal nerves on each face; legumes circinate and reticulate; bark "Minni Ritchi" i.e. reddish and exfoliating in narrow shavings which curl retrorsely from each end; shrubs or small trees normally found along watercourses. 12. *A. trachycarpa*
 Characters not combined as above 38
- 38. Phyllodes c. 6-11 cm long and 1-3 cm wide, obliquely narrowly elliptic with acuminate apices, not falcate, some nerves obviously confluent with the lower margin for a distance above the base; branchlets resinous and minutely puberulous. **A. acradenia*
 Phyllode nerves not basally confluent or if so (rare) then other characters not combined as above 39
- 39. Phyllodes some or all more than 8 cm long 40
 Phyllodes all less than 8 cm long 46
- 40. All parts glabrous (neglect calyx) 41
 Either flowering peduncles or receptacles, phyllodes and/or branchlets (especially on new shoots) or legumes hairy to some degree (hairs often minute and appressed—observed at x10 mag.) 44
- 41. Phyllodes conspicuously lanceolate-falcate, about 10-15 cm long and 10-20 mm wide, together with the branchlets often pruinose; spikes arranged in racemes which normally grow out as new shoots; legumes obviously longitudinally wrinkled when dry, not resinous. **A. tumida*
 Phyllodes often straight, not above 12 mm wide; spikes axillary, not racemose; legumes not obviously wrinkled. 42
- 42. Phyllodes bright olive green, somewhat shiny (observe fresh), c. 10-18 cm long and 2-11 mm wide, 1-3 yellowish nerves more evident than the very obscure, impressed, distant, minor nerves, marginal nerve discrete and yellowish; legumes resinous, 7-12 mm wide, subwoody **A. ancistrocarpa*
 Phyllodes not as above; legumes not resinous, ± chartaceous 43
- 43. Phyllodes 11-20 cm long, 2-3 mm wide, narrowly linear, pale green; spikes dense, pale yellow; calyx more than half the length of the corolla . . . 11a. **A. adsurgens*
 Phyllodes variable, 4.5-12.5 cm long, 1-8 mm wide, often broadly linear or very narrowly elliptic but occasionally narrowly linear; spikes a darker yellow and less dense than above; calyx less than half the length of the corolla 11e. **A. stowardii*

- 44. Legumes glabrous, to 21 cm long; spikes comprising somewhat widely spaced rather large flowers with short, cupular, ± truncate, golden puberulous calyxes that are readily observable at x10 mag.; phyllodes coriaceous, rather rigid and normally ± straight, extremely finely nerved, silvery-sericeous when intermediate aged but glabrous at maturity, very young new shoots golden; small, spreading often gnarled trees on alluvial flats. 13. *A. xiphophylla*
 Legumes hairy, hairs, yellow when young but turning white with age; spikes dense; calyx not as above; phyllodes often falcate, generally less rigid, less coriaceous and more obviously nerved (at x10 mag.) than above, normally 8-14 cm long and 5-15 mm wide 45
- 45. Legumes with a dense, soft appressed sericeous indumentum; flowering peduncles and spike axes (i.e. the receptacles) golden puberulous; phyllodes falcate, the new shoots citron-sericeous but hairs turning silvery-white on intermediate aged phyllodes, glabrous at maturity; graceful trees often with pendulous branches, normally found along watercourses. (Small phyllode variants, c. 5-6 cm long and c. 5 mm wide, are known from tops of rocky ranges) **A. citrinoviridis*
 Legumes with spreading, pilose hairs; peduncles and receptacles sparsely resinous-papillose (not golden puberulous); very young new shoots pale citron-sericeous, quickly passing to glabrous phyllodes; spreading shrubby trees to 4 m, normally on ridges and upper slopes of ranges 8. *A. hamersleyensis*
- 46. Sepals free and linear-spathulate; legumes chartaceous, ± glabrescent, loosely reticulate; phyllodes very variable in shape and size, grey-green, together with branchlets minutely appressed puberulous (at least when young); tall shrubs or trees common on alluvial flats. **A. aneura*
 Characters not combined as above; sepals normally united 47
- 47. Phyllode nerves rather widely spaced (interstices readily observable and wider than diameter of the nerves); phyllodes about 3-5 cm long and 5-10 mm wide; legumes woody and glabrous; uncommon shrubs 48
 Phyllode nerves very fine and close together, either uniform or 1 or more slightly more evident than the rest; legumes chartaceous to coriaceous, hairy or glabrous 49
- 48. Phyllodes and brachlets glabrous; legumes not wrinkled, narrowed towards their base, 6-8 mm wide, to 6 cm long; phyllodes with numerous, prominent, longitudinal nerves which rarely anastomose **A. ptychophylla*
 Phyllodes and branchlets densely and minutely appressed sericeous; legumes coarsely wrinkled when dry, narrowly oblong, 1-2 cm wide, to 16 cm long; phyllodes with rather few, not prominent, widely spaced main longitudinal nerves with sparsely and openly anastomosing, longitudinally oriented lateral nerves between them **A. cuthbertsonii*
- 49. Branchlets and/or phyllodes (at least when young) and flowering peduncles hairy (observe at x10 mag.); legumes hairy or glabrous; bark never "Minni Ritchi". 50
 Branchlets and phyllodes glabrous or if sparsely hairy then bark "Minni Ritchi" i.e. red and exfoliating in narrow shavings which curl retrorsely from each end; legumes glabrous 51
- 50. Low shrubs to 1 m tall; young legumes with sparse, short, spreading hairs, mature legumes not seen; stipules frequently persistent on branchlets, dark brown, 1-2 mm long; phyllodes (3.5) 4-5.5 cm long, 6-10 mm wide, very sparsely reticulate; new shoots not golden hairy; spikes dense 5. *A. daweana*
 Tall shrubs (exceeding 1 m) or more commonly small trees; stipules early deciduous. 13. *A. xiphophylla*
 (or a short phyllode variant of *A. citrinoviridis*, see lead 44 above).

51. Bark "Minni Ritchi"; phyllodes 4.5-6.5 cm long, 5-8 mm wide; flower-heads dense; calyx slightly more than half the length of the corolla; legumes narrowly oblong, c. 5 mm wide; seeds longitudinal.11d. **A. rhodophloia*
Bark grey; flower-heads often less dense than above; calyx half or less than half the length of the corolla.52
52. Legumes narrowly oblong, 4-7 mm wide; seeds longitudinal to longitudinally oblique in the legumes; phyllodes variable, linear to narrowly elliptic, 4.5-9 (10-12.5) cm long, 2-8 mm wide, length to width ratio 9-40.11e. **A. stowardii*
Legumes broadly oblong 10-26 mm wide; seeds transverse to transversely oblique in the legumes; phyllodes \pm narrowly elliptic, 3-7.5(9) cm long, 4-15(17) mm wide, length to width ratio 3-13.11c. **A. kempeana*

1. *Acacia arrecta* Maslin, sp. nov. (Figure 2)

Acacia arida Benth. et *A. orthocarpa* F. Muell. affinis a qua capitulis floralibus globularibus, phyllodiis nec punctulatis, (1.5)2-4 cm longis, 1 mm diam., teretibus, sursum curvatis differt. Etiam ad *Acacia hilliana* Maiden affinis a qua capitalis floralibus globularibus et marginibus leguminis nec incrassatis differt.

Typus: 11 km E of Wittenoom on the road to Port Hedland, Western Australia. 12 July 1980. B. R. Maslin 4644. "Dense rounded shrub 1 m tall, sometimes spreading and \pm flat-topped, dividing at ground level into 6 main branches; bark grey; phyllodes grey-green, slightly curved, ascending; inflorescences and legumes erect. Stony clay in spinifex with *Acacia hilliana*." (holo: PERTH; iso: CANB, K, MEL).

Low, dense, spreading, rounded or \pm flat-topped, slightly viscid *shrubs* to 1 tall and 2 m diam., dividing at ground level into up to 6 main branches. *Bark* smooth except at extreme base of stems where it is slightly fissured, grey but reddish brown towards ends of branches. *Branches* terete, with crenulated resinous ribs which are most evident towards the ends of the branchlets, glabrous. *New shoots* light to medium green, slightly resinous. *Stipules* deciduous. *Phyllodes* terete but slightly compressed upon drying, (1.5)2-4 cm long, 1 mm diam., curved upwards near the base to give a characteristic ascending aspect, glabrous except for the pulvinus, grey-green; abruptly narrowed at apex into callose, acute, innocuous, straight or slightly hooked, light orange-brown points which are c. 1 mm long; *pulvinus* obscure, c. 0.5 mm long, obscurely transversely wrinkled, yellowish orange, grooved adaxially near base, groove densely villous; *nerves* 8, barely visible, submerged; *gland* obscure, situated on the upper margin of the phyllode at the distal end of the pulvinus, comprising raised yellowish nectiferous tissue c. 0.2 mm diam., orifice absent. *Inflorescences* simple and axillary, 1-2 per node, erect. *Peduncles* 15-40 mm long, robust, glabrous, slightly resinous; *basal peduncular bract* solitary, small (c. 0.8 mm long), triangular and \pm persistent. *Flower-heads* globular, light golden 30-45-flowered, c. 7-10 mm diam. at anthesis, quite resinous, flowers densely arranged; *bracteoles* c. 1 mm long, glabrous, claws linear and ending in thickened and inflexed laminae. *Flowers* 5-merous, buds bluntly acute. *Calyx* stout, 1/2-2/3 length of corolla, very shortly divided into broadly triangular lobes, calyx tube strongly 5-nerved with translucent tissue between nerves. *Petals* 2.5 mm long, connate for c. 2/3 their length, glabrous, 1-nerved. *Legumes* erect, subterete to compressed, not constricted between the seeds, tapering towards the base, 4-5.5 cm long, 4-6 mm wide at broadest point, woody, glabrous, yellowish brown to dark brown, vernicose when young, longitudinally nerved, splitting elastically from the top, valves curved following dehiscence, shallowly sigmoid with a swollen apical portion; *margins* not thickened.

Seeds positioned obliquely in the legumes within pronounced depressions, rather persistent following dehiscence of legume, ellipsoid, 3 mm long, 1.5 mm wide, turgid but laterally compressed (2 mm thick), blackish and rather dull, marked with a darker coloured narrow peripheral band of tissue; *pleurogram* fine, open towards the hilum, bordered by pale coloured tissue; *areole* c. 1.7 mm long, 0.6 mm wide; *funicle-aril* narrowly turbinate and straight.

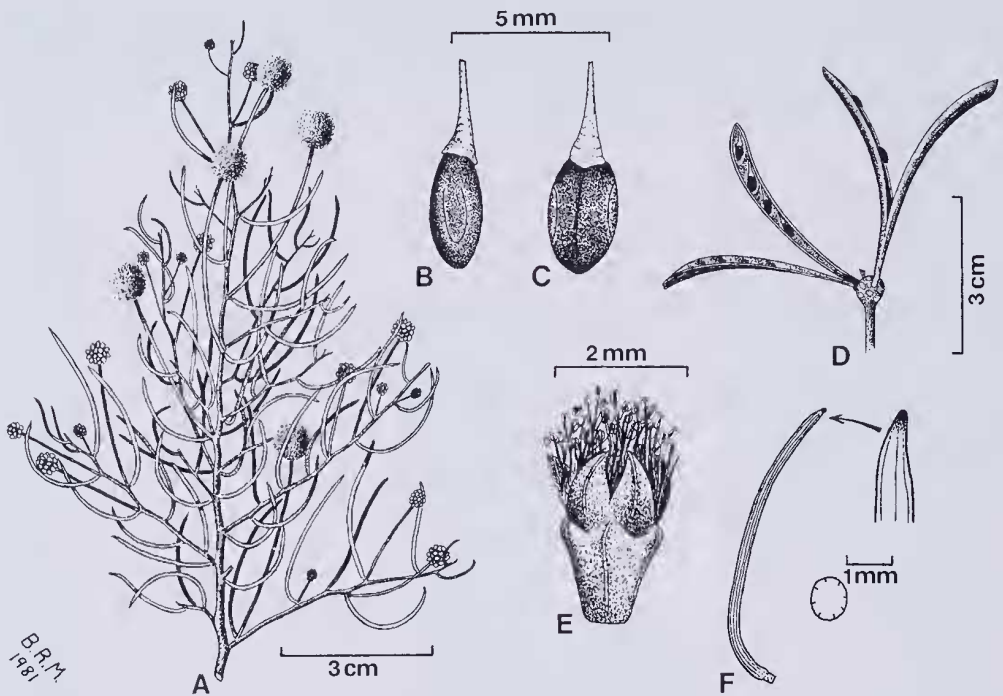


Figure 2. *Acacia arrecta*. A—Portion of branch. B and C—Seed (B—plane view; C—side view). D—Legumes held erect on receptacle (note persistent seeds following dehiscence). E—Flower. F—Phyllode with enlargements showing apex and transverse sectional shape (note position of the 8 nerves).

A from *I. L. Lethbridge* s.n.; B-D from *M. I. H. Brooker* 2089a; E from *K. Stewart* s.n.; F from *B. R. Maslin* 4644 (the type).

Other collections examined. WESTERN AUSTRALIA: 15 mi (24 km) E of Nullagine, *J. S. Beard* 4603 (KP); Millstream, 6 Dec. 1974 and 10 Oct. 1975, *R. F. Black* s.n. (PERTH); Southern tributary of the Fortescue River just E of Gregory Gorge, 30 Jan. 1975, *R. F. Black* s.n. (NSW, PERTH); About 0.5 mi (1 km) SE of Millstream Station homestead, *M.I.H. Brooker* 2089a (CANB, K, MEL, PERTH); 2 mi (3.4 km) E of Yampire Gorge, 22°20'S, 118°30'E, *H. Demarz* 4416 (KP, PERTH); Wittenoom Gorge, Hamersley Range, *A. S. George* 1068 (PERTH); 10 mi (16 km) SE of Wittenoom on Drillers Hill, July and Aug. 1971, *I. L. Lethbridge* s.n. (BRI, PERTH); 40 km E of Wittenoom, *A. A. Mitchell* 348 (PERTH, WAIT); Wittenoom Gorge, Sept. 1957, *K. Stewart* s.n. (PERTH).

Distribution. (Figure 10) North-west Western Australia in the Fortescue Botanical District (1:250 000 maps F50-6, 7, 11, 12; F51-5). Ranging from Millstream (21°35'S, 117°04'E) east to near Nullagine (21°53'S, 120°07'E) and extending south to the northern part of the Hamersley Range around Wittenoom Gorge (22°14'S, 118°20'E).

Habitat. Judging from the relatively few collections to hand, the species favours low rocky hills and associated stony flats in shrub-steppe dominated by 'spinifex' (*Triodia* sp.).

Flowering and fruiting period. It appears as though some flowers are present during most months of the year but the main period is from about December and August. Legumes with mature seeds have been collected in late September. Specimens collected between July and September frequently possess both flowers (in bud and at anthesis) and also developing legumes.

Using Pedley's (1978) classification, *A. arrecta* is placed in section *Plurinerves* (Benth.) Maiden et Betche. In Bentham's (1864) classification the species would occur in series *Calamiformes* (Benth.) Benth., an unnatural series not recognized by Pedley.

Acacia arrecta is a distinctive species with its small, terete, ascending phyllodes, its quite large, globular flower-heads which are held erect, its erect, woody \pm terete, basally narrowed, longitudinally nerved legumes and its straight, narrowly turbinate funicle-aril. These carpological features are essentially the same as those of the closely related species *A. arida* Benth. and *A. orthocarpa* F. Muell. but *A. arrecta* is readily distinguished by its globular (not cylindrical) flower-heads and its non-punctate phyllodes which are either narrower or shorter. In habit and general phyllode morphology the species resembles *A. hilliana* Maiden but is again distinguished by its globular flower-heads and also by its legumes which lack prominently thickened margins. *Acacia arida*, *A. orthocarpa* and *A. hilliana* are all recorded for the Hamersley Range.

The specific epithet alludes to the characteristically ascending phyllodes and also to the erect inflorescences which bear legumes that are held rigidly erect.

2. *Acacia atkinsiana* Maslin, sp. nov. (Figure 3)

Acacia rhodophloia Maslin affinis a qua cortice cinereis non 'Minni Ritchi', etiam characteribus secundis in combinatione differt: capitulis floralibus obloideis (sub anthesi c. 10 mm longis et 8 mm latis), et leguminibus 4-6 mm latis.

Typus: 1 km along South Fortescue Pipeline road (towards Mt Tom Price) from the Mt Bruce to Wittenoom road, 22°38'S, 117°59'E, Western Australia. 10 May 1980. *Malcolm Trudgen* 2493. "Bush 2.2m tall, spreading habit. Bark smooth, reddish brown, rough and fibrous at base of largest stems. Phyllodes dull green. Flowers yellow. Growing in stony, red-brown soil on hilltop. Veg: *Triodia wiseana* hummock grassland with *Eucalyptus leucophloia* emergents." (holo: PERTH; iso: CANB, K, NY).

Open, spreading, rounded or infundibular *shrubs* to 3.3 m tall and with up to c. 6 spreading-erect main stems arising from ground level, occasionally single-stemmed and with a spindly aspect, becoming bushy in regrowth situations. *Bark* fissured at base of main stems otherwise smooth, grey externally but reddish brown underneath. *New shoots* resinous, dark brownish when dry, either terminal on branchlets or if axillary then associated with inflorescences. *Branchlets* terete, very obscurely nerved, glabrous, apically somewhat resinous and reddish brown or light brown but becoming grey with age. *Stipules* deciduous, triangular, c. 0.5 mm long, thickened adaxially. *Phyllodes* variable, very narrowly elliptic to narrowly oblanceolate, 6-14.5 cm long,

(4)5-10(12) mm wide, length to width ratio (8.5)10-20(26), slightly curved, ascending, coriaceous but not particularly rigid, glabrous, characteristically pale grey-green, reflecting sunlight in a \pm silvery fashion, resinous (resin layer very thin and not sticky); *apex* possessing a brown, obtuse, knob-like callosity which is often slightly recurved, callosity very pronounced on young phyllodes; *pulvinus* 3-5 mm long, transversely wrinkled, yellow to brown; *gland* situated on upper margin of the phyllode at the distal end of the pulvinus, lamina swollen about the gland, submerged, comprising a circular orifice c. 0.3 mm diam. and a very indistinct rim; longitudinal *nerves* numerous, very fine and close together, not anastomosing, the central nerve and normally one on either side of it slightly more evident than the rest, margins yellowish but not thickened. *Inflorescences* axillary, 1-2 per node, normally arising at extreme base of a rudimentary shoot which usually grows out. *Peduncles* 8-15 mm long, rather stout, glabrous; *basal peduncular bract* deciduous, triangular, c. 1-1.5 mm long, concave. *Flower-heads* obloid, c. 10 mm long and 8 mm wide at anthesis, somewhat resinous, c. 90-flowered, flowers densely arranged; *bracteoles* linear-spathulate, c. 1-1.5 mm long, lamina inflexed and resin-papillose (papillae white). *Flowers* predominantly 5-merous although a few 6-merous flowers are present in some heads. *Calyx* slightly exceeding half the length of the corolla, gamosepalous, stout, very shallowly divided into broadly triangular resin-papillose (papillae white) lobes which are visible in inflorescence buds, calyx tube \pm obscurely 5-nerved and glabrous. *Petals* c. 2-2.5 mm long, glabrous, 1-nerved. *Legumes* broadly linear, to 10 cm long, 4-6 mm wide, slightly curved, \pm cartilaginous to firmly chartaceous, wrinkled when young, flat, barely raised over seeds, glabrous, slightly greyish brown, somewhat resinous but not sticky, abruptly narrowed at apex, basal stipe c. 5 mm long; *margins* slightly thickened, not constricted between seeds. *Seeds* longitudinal to very slightly obliquely placed in the legume, narrowly obloid or sometimes narrowly elliptic, narrowed at hilar end, 4.5-5 mm long, 2 mm wide, somewhat compressed (1 mm thick), dark brown but areolar area yellowish, not mottled, shiny; *pleurogram* obscure, open towards the hilum, surrounded by yellowish tissue; *areole* less than 0.5 mm long; *funicle* c. 3 mm long, flattened and membranous, gradually expanded into a convoluted creamy white *aril* which extends down c. 1/3 the length of the seed.

Selected specimens. WESTERN AUSTRALIA: About 1 km S of Tom Price airport, *K. Atkins* 1209 (CANB, PERTH) and 1213 (K, PERTH); Marandoo, just S of Mount Bruce, Hamersley Range, \pm 22°40'S, 118°09'E, *C. Dawe* M154 (CBG, PERTH); Rio Tinto Gorge, Hamersley Station, *H. Demarz* D5755 (KP, PERTH); 65 km W of Millstream, *H. Demarz* D7084 (PERTH, TLF); 75 mi (120 km) from Wittenoom towards Roebourne, *B. R. Maslin* 2733 (AD, MEL, NSW, PERTH); 14 mi (22.5 km) S of Robe River crossing on North West Coastal Highway, *B. R. Maslin* 2761 (B, BM, G, NSW, P, PERTH); Hamersley Range National Park, on the Wittenoom to Juna Downs road 7.2 mi (11.5 km) S of turn-off to Mount Bruce, *M. E. Trudgen* 2503 and *G. Marney* (BRI, PERTH).

Distribution. (Figure 10) North-west Western Australia in the Fortescue Botanical District (1:250 000 maps F50-6, 7, 10, 11, 16). Extending from the vicinity of Mount Bruce in the Hamersley Range (22°36'S, 118°08'E) north-west to the North West Coastal Highway around Yarraloola Station (21°34'S, 115°53'E).

Habitat. Favours rocky loam on spinifex (*Triodia pungens*, *T. wiseana*) plains and is associated with a variety of species including *Acacia ancistrocarpa*, *A. aneura*, *A. pruinocarpa*, *Cassia* spp., *Eucalyptus leucophloia*, etc. *Acacia atkinsiana* often forms dense regrowth populations in disturbed sites such as along road verges and in burnt areas.

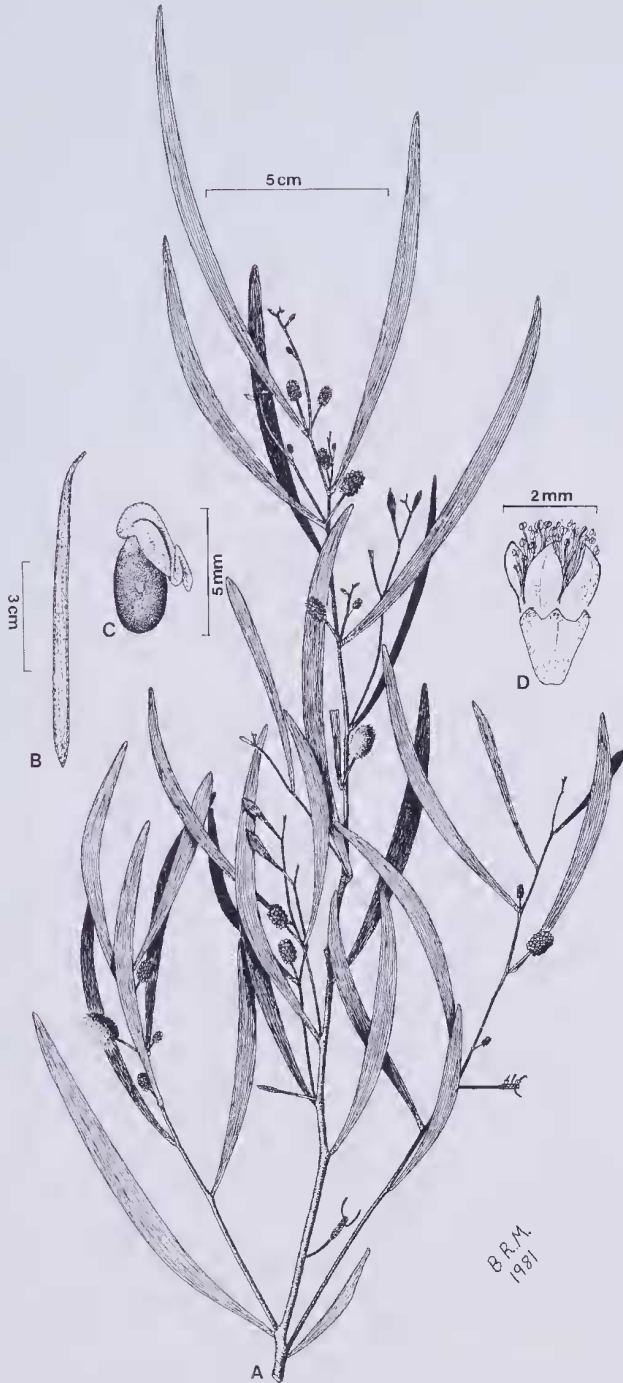


Figure 3. *Acacia atkinsiana*. A—Portion of branch. B—Legume. C—Seed. D—Flower. A from M. E. Trudgen 2503 and G. Marney; B, C from H. Demarz D5755; D from B. R. Maslin 2761.

Flowering and fruiting period. Most flowering specimens have been gathered from May to July, however, some have also been collected between December and March. From anthesis it takes about 3 months for seed to mature. Fruits with mature seeds have been collected in September and October.

Acacia atkinsiana belongs to section Juliflorae (Benth.) Maiden et Betche and is a member of the *A. stowardii* Maiden group of species (see species no. 11 below). The new species is most closely related to *A. rhodophloia* Maslin from which it is readily distinguished by its grey bark (not red and exfoliating in narrow strips which curl retrorsely from each end i.e. 'Minni Ritchi'). *Acacia rhodophloia* is a variable species (Maslin, 1980) and throughout most of its range has cylindrical flower-heads, a character further distinguishing it from *A. atkinsiana*. However, in the region of the Murchison River (which is about 600 km south of the main area of distribution of *A. atkinsiana*) *A. rhodophloia* has flower-heads which are globular or obloid and phyllodes which are 3-8 mm wide. Flowering specimens from these populations may therefore resemble those of *A. atkinsiana*, but in addition to its grey bark and its more northerly distribution, the new species is recognized by its generally longer phyllodes (4-8(9) cm in the Murchison River variant of *A. rhodophloia*), its lack of minute, ferruginous resin-hairs on its new shoots, peduncles, calyx lobes and bracteole laminae, and by its broader legumes (2 mm wide on the Murchison River variant).

The specimen, *H. Demarz* D7084, 65 km W of Millstream, previously cited under *A. rhodophloia* (Maslin, 1980) is *A. atkinsiana*.

The species is named in honour of Mr Ken Atkins who provided much valuable field data and many specimens of *Acacia* from the Tom Price-Paraburdoo area.

3. *Acacia bivenosa* DC., Prod. 2: 452 (1825)

The Hamersley Range populations of this variable species are characterized as follows. Dense, bushy shrubs to 2.5 m tall, with up to 6 spreading-erect branches arising from ground level, occasionally single-stemmed and wispy (see pendulous variant referred to below). Phyllodes obovate to narrowly elliptic, 2-5.5 cm long, 8-15 mm wide, length to width ratio 2.5-6, bright green on new growth, fleshy and subglaucous to distinctly glaucescent when mature, finely wrinkled upon drying, 2-nerved (the principal longitudinal nerve is \pm centrally situated and a minor second nerve occurs on the adaxial side of it). Inflorescences racemose but racemes normally grow out as leafy shoots, the peduncles then appearing axillary, conflorescence acropetalous, flower-heads rich golden, buds bright green. Legumes woody.

As discussed by Pedley (1977) *A. bivenosa* is a member of a complex species-group whose centre of diversity is Western Australia. The Hamersley Range populations of *A. bivenosa* often have phyllodes slightly more elongate than normal for this species which according to Pedley are usually less than 3.5 times as long as wide. Seemingly when initiated the inflorescences are always racemes of which most, but usually not all, grow out as leafy shoots. This explains why on a single plant both racemes and simple axillary heads can be observed. No plants definitely attributable to the sand-loving species *A. ligulata* A. Cunn. ex Benth. have been observed from the Hamersley Range area. This species is very closely related to *A. bivenosa* and differs in its generally more elongate, 1-nerved phyllodes and in its racemes which normally do not grow out. Pedley (l.c.) treats *A. ligulata* as a subspecies of *A. bivenosa*, however, I feel that until a thorough analysis of these two species and their allies has been

undertaken it is preferable to treat them as distinct species. If subspecific rank is applied, then other species such as *A. rostelifera* Benth., *A. xanthina* Benth., *A. tysonii* Luehm. and perhaps even *A. sclerosperma* F. Muell., *A. ampliceps* Maslin and *A. salicina* Lindl. would have to be considered subspecies of a single, highly polymorphic species. Judging from morphological evidence based on limited field observations, it seems that hybridity may possibly be a causal factor in contributing to the complexities observed within this species-group. Chromosomal and pollen analyses of the possible hybrids discovered so far are currently being undertaken and the results will be published elsewhere.

In various places between Tom Price in the Hamersley Range and Dampier on the coast some 200 km to the north, a very attractive variant of *A. bivenosa* has been observed. It seemingly differs from typical *A. bivenosa* only in its habit (although legumes and seeds have not been seen) which is open and rather wispy. The variant is single-stemmed or sparingly branched at ground level and has delicate, characteristically pendulous branchlets. I have refrained from attributing formal rank to this variant until a detailed overall appraisal of the *A. bivenosa* group is undertaken.

4. *Acacia cuspidifolia* Maslin, sp. nov. (Figure 4)

Acacia victoriae Benth. affinis a qua phyllodiis pungentibus, inflorescentiis semper axillaribus differt. Etiam ad *Acacia pickardii* Tindale affinis a qua phyllodiis planis differt.

Typus: 2 km south of Hill 4 East (mine) Paraburdoo, Western Australia. 28 Nov. 1980. K. Atkins 1257. "Sub-tree 3.5 m tall. Growing on a low silcrete mound in association with *Acacia victoriae*, *Lawrenzia glomerata* and *Enchylaena tomentosa*." (holo: PERTH; iso: CANB, K, NY).

Dense, bushy, much branched *shrubs* to c. 3 m diam., growing to more or less gnarled *trees* 3-7 m tall. *Bark* fibrous and fissured on main trunks. *Branchlets* terete, finely nerved, glabrous or sometimes sparsely puberulous, grey-green to brownish. *Stipules* 2-4 mm long, stout, indurate, spiny, spreading and slightly recurved, absent from some nodes. *Phyllodes* narrowly oblong to narrowly obovate, size rather variable, (2)3-6(7.5) cm long, 2-5 mm wide, L/W = 6-15(25), straight to slightly curved, normally medium olive green when mature, bright light green when young, glabrous to glabrescent, \pm abruptly contracted at apices into fine yet sharply pungent light brown apical points c. 2 mm long; *pulvinus* obscure and < 0.5 mm long; *midrib* prominent, lateral veins fine (yet readily apparent at least when dry) and forming a sparse open reticulum; *gland* situated on the upper margin of the phyllode at the distal end of the pulvinus or up to 5 mm above it, circular to oblong, 0.5-1 mm long, lip not prominent, an additional (smaller) gland normally present on the upper margin below the apical mucro. *Inflorescences* simple and axillary, (1)2 per node, conflorescences acropetalous i.e. inflorescences initiated within axils of young phyllodes along actively growing terminal new shoots, these subtending phyllodes reach maturity by the time the heads reach anthesis. *Peduncles* 15-20 mm long, glabrous or sometimes puberulous, base ebracteate at anthesis. *Flower-heads* globular, pale yellow, 23-32-flowered. *Bracteoles* linear-spathulate, 0.5-1 mm long, laminae ciliolate, claws glabrous. *Flowers* 5-merous. *Sepals* 1/3-1/2 length of petals, free or variably united for c. 1/2 their length, this range of variation present even in a single flower-head, narrowly oblong, apically minutely puberulous. *Petals* c. 2.5 mm long, apically marginally minutely white-papillose otherwise glabrous, nerveless.

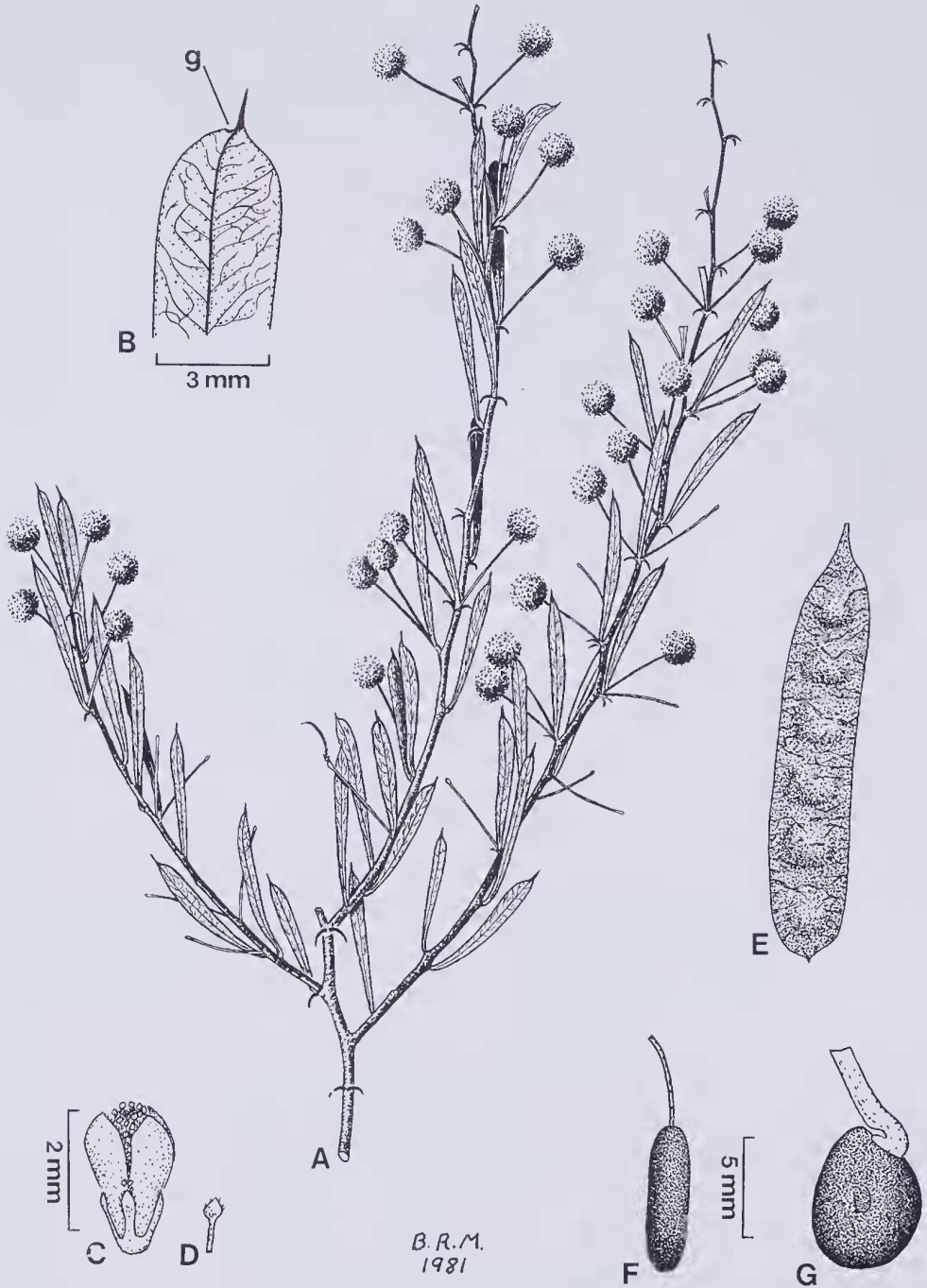


Figure 4. *Acacia cuspidifolia*. A—Portion of branch (note recurved spiny stipules and twinned peduncles). B—Phyllode apex showing spiny apical mucro with a small gland (g) at its base. C—Flower. D—Bracteole. E—Legume. F and G—Seed showing strap-like funicle (F—side view; G—plane view). A, B from H. Demarz 2778; C, D from A. M. Ashby 4491; E-G from B. R. Maslin 2771.

Legumes narrowly oblong, 4.5-9 cm long, 1-2 cm wide, chartaceous, flat, glabrous, light brown, transversely openly reticulate, slightly umbonate over seeds; *margins* barely thickened, yellowish, normally only very slightly constricted between the seeds but random deep constrictions do occur. *Seeds* positioned transversely to obliquely in the legume, broadly ellipsoid to broadly obovoid, 6-7.5 mm long, 5-6 mm wide, compressed (1.5-2 mm thick), brown, not shiny; *pleurogram* an elongated "u"-shape, open towards the hilum; *areole* c. 1.5 mm long, 0.5-1 mm wide, a darker colour than rest of the seed prior to maturity; *funicle* relatively thick and strap-like, normally straight but once-folded close to the hilum, not expanded into an aril.

Other collections examined. WESTERN AUSTRALIA: North West Coastal Highway between Geraldton and Carnarvon, c. 5 km S of Yaringa Station turn-off, A. M. Ashby 4491, flower specimens collected 12 Dec. 1971, fruits collected by G. Phillips from the same plant 15 April 1972 (CANB, K, MEL, PERTH); About 130 km N of Meekatharra on Great Northern Highway, K. Atkins 1264 (PERTH); West of Salt Lake, J. S. Beard 3510 (KP, PERTH); Gascoyne Junction, J. S. Beard 4366 (PERTH); 33 km along road from Mundiwindi to Mount Newman, H. Demarz 611 (KP, PERTH); 53.5 mi (85.5 km) N of Meekatharra, H. Demarz 2778 (KP, PERTH); 45 km N of Lyndon River, H. Demarz 7652 (PERTH); Dairy Creek Station, 160 mi (256 km) E of Carnarvon, R. O'Farrell 48 (PERTH); Merlinleigh, between Gascoyne and Minilya Rivers, C. A. Gardner 6152 (PERTH); Wandagee, Minilya River, C. A. Gardner 6208 (PERTH); 125 km S of Carnarvon of North West Coastal Highway, B. R. Maslin 2771 (PERTH); Paraburdoo, B. R. Maslin 4653 (PERTH); 41.5 km E of North West Coastal Highway on the Carnarvon-Gascoyne Junction road, B. R. Maslin 4996 (PERTH); 24.5 km S of Gascoyne Junction on the road to Towrana Station, B. R. Maslin 5003 (PERTH); Glenburgh Station, 120 km E of Gascoyne Junction on the road to Meekatharra, B. R. Maslin 5012 (PERTH).

Distribution. (Figure 10) North-west Western Australia in the Ashburton, Carnarvon, northern Austin and southern Fortescue Botanical Districts (1:250 000 maps F49-16; F50-13, 15; F51-13; G50-1, 5, 6, 8) extending from the vicinity of Shark Bay (c. 25°30'S, 114°E) east to near Meekatharra (26°35'S, 118°30'E) and north to the Hamersley Range. The species extends only to the southern extremity of the Hamersleys (around Paraburdoo—23°12'S, 117°40'E) and is not a conspicuous element of the *Acacia* flora of the region.

Habitat. Favours open floodplain areas in clay or loam.

Flowering and fruiting period. Flowers from October to December; mature seed has been collected in April and June.

Acacia cuspidifolia is a member of Sect. Phyllodineae DC. and has its closest affinities with the widespread, variable species *A. victoriae* Benth. These two species have been observed to grow sympatrically in places e.g. between Carnarvon and Gascoyne Junction. The significant gross morphological features shared by the two species include their spiny stipules, their flat, 1-nerved phyllodes, their normally twinned inflorescences, their globular, pale yellow flower-heads bearing a similar number of flowers, their \pm free sepals and their large, flat, chartaceous legumes. *Acacia cuspidifolia* is readily distinguished from *A. victoriae* by its pungent phyllodes and by its inflorescences which are never racemously arranged. Pollen studies by Ph. Guinet (pers. comm.) support a close *A. cuspidifolia*-*A. victoriae* relationship and also show these species to be closely related to *A. pickardii* Tindale

(which is restricted to the extreme north-east of South Australia and adjacent Northern Territory). *Acacia pickardii* is distinguished from these two species, and indeed from all other members of the *A. victoriae* group by its terete, pungent phyllodes.

The specific epithet alludes to the spiny phyllode apices which are characteristic for this taxon.

5. *Acacia daweana* Maslin, sp. nov. (Figure 5)

Acacia hammondii Maiden et *A. malloclada* Maiden et Blakely affinis sed combinatione characterum secundarum distinguenda: fruticibus ad 1 m altis phyllodiis anguste ellipticis (3.5) 4-5.5 cm longis, 6-10 mm latis, nervis tenuibus numerosisque nervo medio (et plerumque nervo uterque latis) plus prominentibus, parce reticulatis; spicis densis; calyce breviter tomentoso.

Typus: 6 km N of Marandoo (which is just south of Mount Bruce) on the road to Tom Price, 22°35'S, 118°05'E, Western Australia. 16 July 1980. *B. R. Maslin* 4682. "Shrub 1 m tall, stem 2-branched at base; phyllodes dull green; flower-heads bright golden. Low rocky rise in spinifex at base of rocky range." (holo: PERTH, iso: CANB, K, NY).

Low, spreading, often more or less flat-topped, dense *shrubs* to 1 m tall, dividing near ground level into a few to many spreading-erect, slender branches. *Bark* on main stems grey but near their base peeling to reveal a reddish undersurface. *Branchlets* terete, very finely nerved, very slightly resinous, apically yellow but becoming reddish-brown with age, shortly tomentose or shortly antrorsely strigose but becoming glabrous with age. *Stipules* frequently persistent on branchlets, triangular, 1-2 mm long, 0.6-0.8 mm wide at base, dark brown, 3-nerved (nerves sometimes obscure), adaxially appressed hairy or sometimes glabrous. *Phyllodes* narrowly elliptic with the upper margin slightly more convex than the lower margin, (3.5)4-5.5 cm long, 6-10 mm wide, length to width ratio 4.5-8, straight or more normally slightly curved towards the apex, rather spreading, glabrous or glabrescent (indumentum as on branchlets), medium olive green, not shiny; *apical mucro* thickened, acute but not pungent, normally slightly curved, brown; *pulvinus* 1-2 mm long, transversely wrinkled, yellowish; *nerves* fine with the central one (and normally one on either side of it) more evident than the rest, very sparsely anastomosing, nerves close together but the interstices broader than the width of the nerve, marginal nerve discrete and yellow; *gland* situated on upper margin of the phyllode at the distal end of the pulvinus (or 1-3 mm above it), obscure, 0.3-0.5 mm long, lip narrow and yellowish and not significantly thickened, normally with a discrete circular or oblong central orifice. *Inflorescences* simple and axillary but sometimes appearing falsely racemose due to the loss of the subtending phyllode, 1 per node, somewhat clustered towards the ends of the branchlets. *Peduncles* 5-10 mm long, indumentum as on branchlets, base ebracteate at anthesis. *Spikes* light golden, flowers densely arranged, 25-40 mm long and 5-6 mm wide when dry; *bracteoles* linear-spathulate, minute (<1 mm long), light or dark brown, sparsely hairy abaxially, lamina inflexed and acute. *Flowers* 5-merous. *Calyx* c. 1/3 the length of the corolla, cupular, gamosepalous, shortly divided into broadly triangular lobes, shortly tomentose. *Petals* c. 1.7 mm long, connate for c. 1/2 their length, glabrous or sparsely shortly tomentose on lower half, obscurely 1-nerved. *Ovary* papillose. *Legumes* (immature, few seen) to 40 mm long and 7 mm wide, prominently raised over seeds,

the umbo dark brown and the intervening flat area greyish brown, rather obscurely transversely reticulate, slightly viscid, sparsely shortly pilose with a mixture of white and yellow hairs; *margins* yellowish, constricted between the seeds. *Seeds* (immature) obliquely placed in the legume, \pm ellipsoid, 3 mm long, 2 mm wide, light brown, not shiny; *funicle-aril* somewhat thickened and fleshy, convoluted yellowish, somewhat shiny.

Other collections examined. WESTERN AUSTRALIA: East side of a conical hill lying 3 km W of Mt Bruce, C. G. Dawe 210 (PERTH); 15 km N of Juna Downs on the road to Wittenoom, B. R. Maslin 4628 (PERTH).

Distribution. (Figure 11) North-west Western Australia in the Fortescue Botanical District (1:250 000: F50-11). Known only from the Hamersley Range National Park where it has been collected from a low hill about 3 km west of Mount Bruce (22°36'S, 118°08'E) and also 30 km to the south-east at about 15 km north of Juna Downs Station (22°53'S, 118°29'E). At both these localities *A. daweana* occurs sympatrically with *A. effusa* (see below). Current indications are that both these species have restricted distributions, however, much of the Hamersley Range area is poorly collected, therefore, an accurate assessment of their conservation status cannot be made at the present time.

Habitat. As for *A. effusa* (see below).

Flowering and fruiting period. Due to the paucity of collections the full flowering-fruiting range has not been determined. All flowering specimens to hand were gathered in mid-July. The one fruiting specimen seen possessed immature seeds and was collected in late September. Despite prolific flowering at the Mount Bruce population very little fruit was set (Chris Dawe, pers. comm.).

Acacia daweana is placed in section Juliflorae (Benth.) Maiden et Betche and on account of its persistent stipules, its narrowly elliptic, multistriate phyllodes, its long, spicate inflorescences and its gamosepalous calyx, seems best placed near *A. hammondii* Maiden (W.A. N.T. Qld.) and *A. malloclada* Maiden et Blakely (N.T.) but the relationship is not particularly close. *Acacia daweana* is distinguished from both these species by its broader, sparingly reticulate phyllodes, its denser spikes and its more hairy calyx. *Acacia hammondii* has glabrous or glabrescent branchlets and grows to a tree about 4 m tall (Pedley 1978: 155). Its phyllodes have two nerves slightly more pronounced than the rest and these are situated more or less midway between the centre of the phyllode and each of its margins. *Acacia daweana* on the other hand has conspicuously short-tomentose branchlet apices, is a shrub to 1 m tall and has its phyllodes show the central nerve to be slightly more evident than the rest. *Acacia malloclada* apparently is not a very common species and besides the type (which is simply annotated "Northern Australia") the only other specimen known to me is *G. Chippendale* 4347 collected from 2.6 mi (4 km) N of Edith River, Northern Territory (NT). According to John Maconochie (pers. comm.) the plants at this locality are spreading shrubs to 2 m tall. Although *A. malloclada* has quite densely hairy branchlets (hairs more or less silky and antrorse) it can be distinguished from *A. daweana* (in addition to the characters already noted above) by its phyllodes which are more coarsely striate and which do not have a more pronounced central nerve.

The species is named in honour of Chris Dawe in appreciation of his help in collecting specimens and providing valuable field data on many of the species included in this paper.

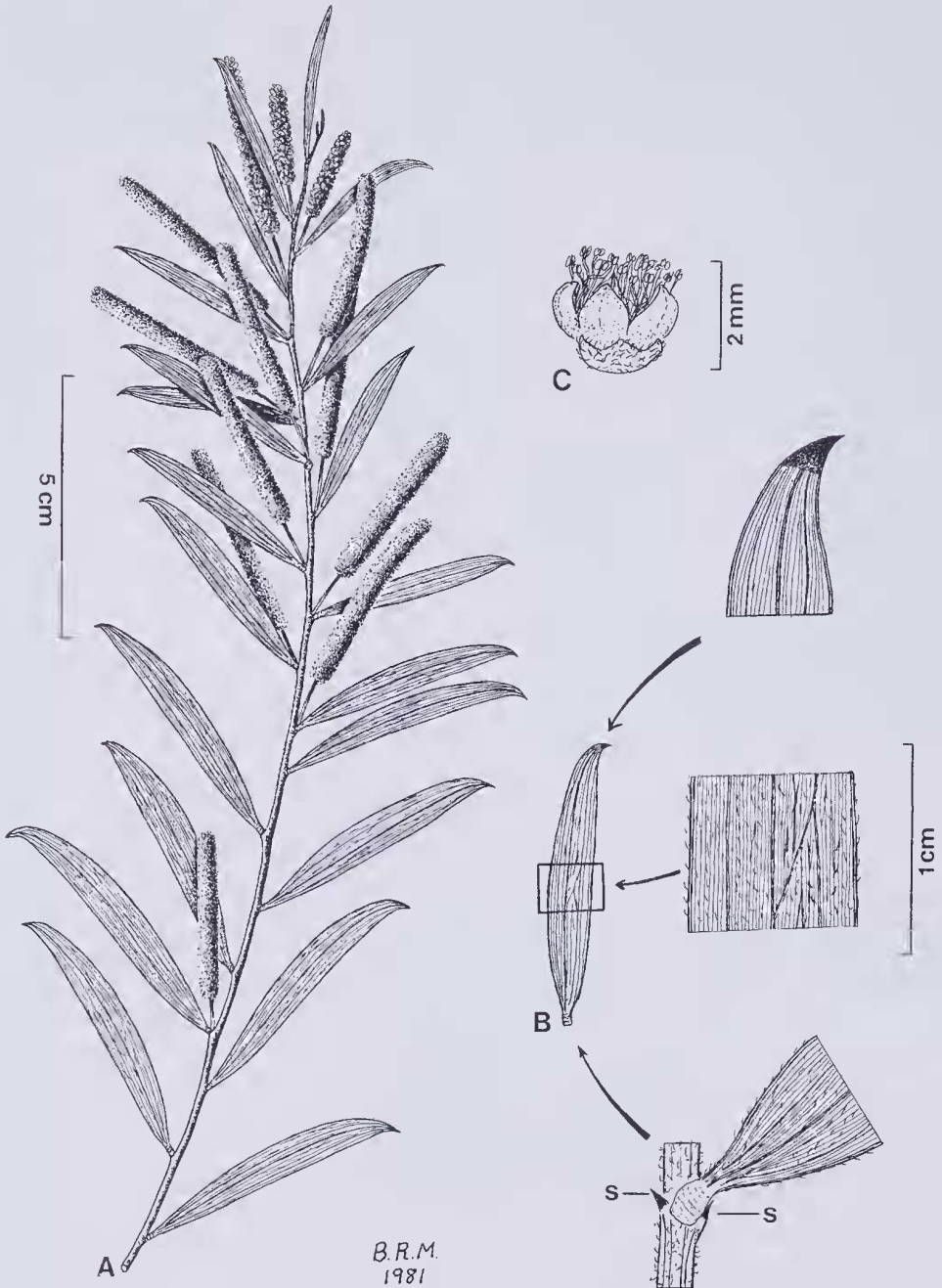


Figure 5. *Acacia dawweana*. A—Portion of branch. B—Phyllode with enlargement showing apex, sparsely anastomosing nerves in middle of lamina and base showing stipules (s). C—Flower. A from *B. R. Maslin* 4682 (the type); B, C from *B. R. Maslin* 4628.

6. *Acacia effusa* Maslin, sp. nov. (Figure 6)

Ex affinitate *A. lysiphloia* F. Muell. et specierum affinium sed fruitice ad 1 m alto; phyllodiis asymmetricice ellipticis ad apice rostriformibus, 9-15 mm longis, 3-7 mm latis distinguenda.

Typus: 6 km N of Marandoo (which is situated just south of Mount Bruce) on the road to Tom Price, Hamersley Range, 22°35'S, 118°05'E, Western Australia. 16 July 1980. B. R. Maslin 4681. "Low, dense, spreading, sometimes flat-topped shrub to 1 m x 2-3 m; bark 'Minni Ritchi'; phyllodes olive green, venation mealy white; spikes bright golden. Low rocky rise in spinifex at base of rocky range." (holo: PERTH; iso: CANB, K, MEL).

Low, dense, somewhat viscid, wide-spreading *shrubs* to 1 m tall and 2-3 m diam., either domed or flat-topped, stems branching at ground level. *Bark* "Minni Ritchi", outer cortex grey (old trunks) or greyish red (younger branches) and exfoliating in narrow shavings which tend to curl retrorsely from each end to reveal a dull red under layer. *Branchlets* terete, obscurely nerved, minutely puberulous (hairs very fine, patent, \pm straight or curled), becoming glabrous with age. *Stipules* persistent on branchlets but deciduous with age, triangular, 1-2 mm long, scarious, dark brown. Phyllodes asymmetrically elliptic with rostriform apices (i.e. rounded and ending in a laterally positioned, acute, subpungent, straight, brown mucro), 9-15 mm long, 3-7 mm wide, length to width ratio 2-4, \pm ascending, indumentum as on branchlets, olive green; with one central *nerve* and a second longitudinal nerve running adjacent to the thickened adaxial margin, lateral nerves anastomosing and trending longitudinally, nerves sometimes mealy (observe fresh); *pulvinus* c. 0.5 mm long, yellowish; *gland* not prominent, situated on the upper margin of the phyllode 2-4.5 mm above the pulvinus, margin sometimes shallowly indented about the gland, circular or slightly elongated, c. 0.3 mm long, lip not prominent, sometimes with a dark brown central area. *Inflorescences* simple and axillary, 1 per node, concentrated towards the ends of the branches. *Peduncles* 7-10 mm long, puberulous, base ebracteate at anthesis, often with a very small (0.5-1 mm long) appressed brown scarious bract situated on upper half of peduncles. *Spikes* bright golden, normally about twice as long as the peduncles (10-15 mm at anthesis or up to 25 mm when in fruit), flowers not particularly densely arranged; *bracteoles* subsessile, c. 0.5 mm long, laminae slightly thickened and slightly inflexed, apiculate, glabrescent. *Flowers* 5-merous but occasionally a few 4-merous flowers interspersed within the spikes. *Calyx* rather membranous, glabrescent, about 1/3 the length of the corolla, divided 1/2-2/3 its length into lobes that are apically yellow. *Petals* spreading at anthesis, glabrous, obscurely 1-nerved (nerves slightly thickened at petal apices). *Legumes* circinate, 6-8.5 cm long (expanded length), 7-8 mm wide, thickly coriaceous, flat but slightly raised over the seeds, resinous, glabrous, dark brown, \pm obscurely longitudinally reticulate; *margins* thickened, not (or slightly) constricted between the seed, yellowish. *Seeds* obliquely positioned in the legume, ellipsoid, 3 mm long, 2.5 mm wide, compressed (1 mm thick), dark tan; *pleurogram* circular, continuous; *areole* situated in the middle of the seed, 0.5 mm diam., surrounded by a definite band of yellowish tissue which is c. 0.3 mm wide; *funicle* filiform, c. 1 mm long, expanded into a large folded *aril* positioned on top of the seed and often extending about half way down one side of it, the aril is cream and membranous but becomes darker and indurate near the hilum.

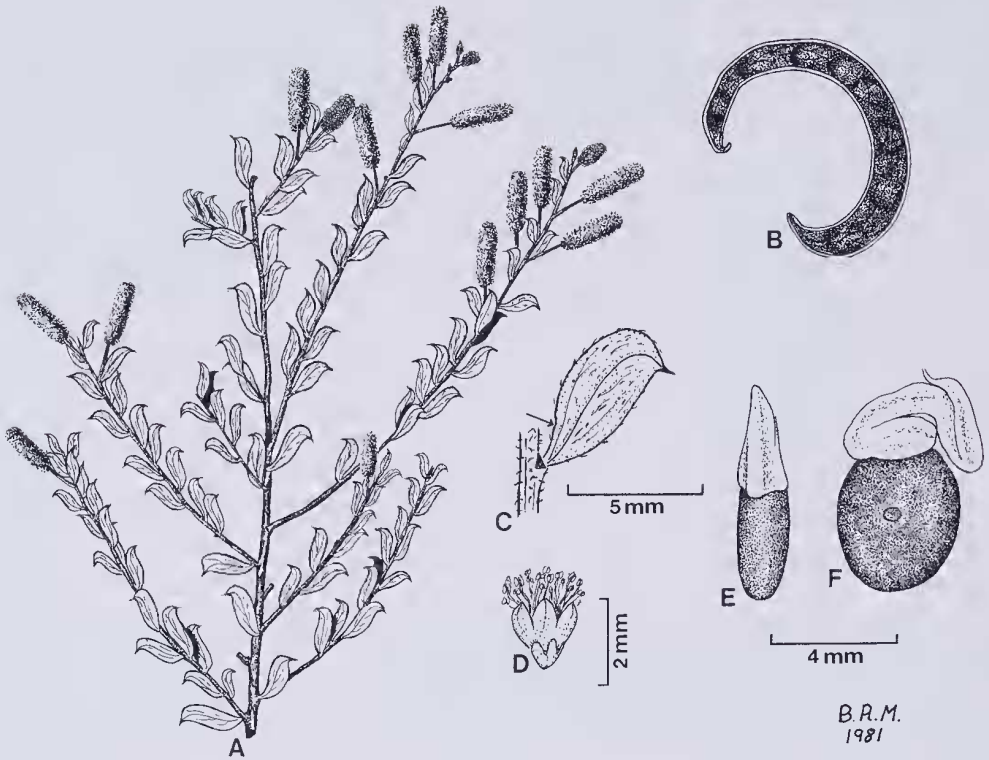


Figure 6. *Acacia effusa*. A—Portion of branch. B—Legume. C—Node showing phyllode subtended by stipule (gland position arrowed). D—Flower. E and F—Seed (E—side view; F—plane view).

A, C, D from *B. R. Maslin* 4681 (the type); B, E, F from *C. G. Dawe* 212.

Other collections examined. WESTERN AUSTRALIA: Just west of the base of Mount Bruce, *C. G. Dawe* 008 (PERTH); East side of conical hill, 3 km W of Mt. Bruce, 22°35'S, 118°05'E, *C. G. Dawe* 212 (BRI, CANB, K, PERTH); 15 km N of Juna Downs on the road to Wittenoom, *B. R. Maslin* 4627 (PERTH); North-east slope of Mount Bruce, *R. Pullen* 10.940 (AD); Gully at base of south side of Mount Bruce, Hamersley Range National Park, 22°36'S, 118°07'E, *M. E. Trudgen* 319 (BRI, PERTH); Hamersley Range National Park, western foot of Mount Bruce, 17 Aug. 1974, *J. H. Willis* s.n. (MEL 503364, PERTH).

Distribution. (Figure 11) North-west Western Australia in the Fortescue Botanical District (1:250 000:F50-11). Known only from the Hamersley Range National Park where it has been collected from around the base of Mount Bruce (22°36'S, 118°08'E) and also 30 km to the south-east at about 15 km north of Juna Downs Station (22°53'S, 118°29'E). According to the collector's notes on *C. G. Dawe* 008 the species is common between Mount Bruce and Wittenoom Gorge (22°14'S, 118°20'E). At the localities from where collections have been made, *A. effusa* is locally abundant and occurs sympatrically with *A. daweana* (see above). Current indications are that both these species have restricted distributions. However, much of the Hamersley Range area is poorly collected, therefore an accurate assessment of the conservation status of these species cannot be made at the present time.

Habitat. Among spinifex (*Triodia* sp.) in rocky red loam on the lower scree slopes of low ranges and in particular along creek lines where these watercourses leave the hills. *Acacia effusa* seemingly does not extend far up the rocky slopes nor does it spread far along the alluvial flats where the creeks run into broad valleys.

Flowering and fruiting period. Judging from the specimens at hand the flowering period extends from about May to August. Legumes with slightly immature seeds have been collected in late September.

Acacia effusa belongs to section Juliflorae (Benth.) Maiden et Betche and is related to *A. lysiphloia* F. Muell. and its allies (i.e. *A. chisholmii* F. M. Bailey, *A. gracillima* Tindale and *A. trachycarpa* E. Pritzel). These arid zone-subtropical* species all have "Minni Ritchi" bark (i.e. reddish and exfoliating in narrow shavings which curl retrorsely from each end), persistent stipules, few-nerved mucronulate phyllodes, viscid flat reticulate often circinate legumes with thickened margins, and obliquely positioned, dark coloured seeds with small continuous areoles that are surrounded by a narrow band of pale coloured tissue. *Acacia effusa* is readily distinguished from other members of the *A. lysiphloia* group by its low, diffuse habit and by its small, asymmetrically elliptic phyllodes (normally long and linear in the other species). *Acacia monticola* J. M. Black is another "Minni Ritchi" species that is not too distantly removed from the *A. lysiphloia* group but is readily recognized by its short, broad phyllodes (12-30 mm long and 5-15 mm wide) and its normally globular (not spicate) flower-heads. Both *A. monticola* and *A. trachycarpa* occur in the Hamersley Range. Aspects of speciation in *Acacia*, including the *A. lysiphloia* group, are discussed in Hopper and Maslin (1978) and Maslin and Hopper (in press).

The specific epithet refers to the characteristic wide-spreading growth habit of this species.

7. *Acacia exilis* Maslin, sp. nov. (Figure 7)

Acacia tenuissima F. Muell. affinis a qua ramulis non resinocostatis, phyllodiis 14-18 cm longis, spicis minus confertis perflavidis (magis aureis), leguminis 4-5 mm latis, funiculo-arillo albido differt.

Typus: Hamersley Range National Park, 8.1 km from Milli Milli Springs towards Coppin Pool, Western Australia. 7 May 1980. *Malcolm Trudgen* 2413. "A bush 2.5 m tall with several stems. Bark grey, reddish on upper branchlets, twigs orange. Flowers yellow. Phyllodes quite soft. Veg: *Triodia* grassland with *Eucalyptus* cf. *oleosa* (MET 2412) mallee and *Acacia*. Soil light brown loam (calcrete area)." (holo: PERTH; iso: CANB, K, MEL, NY).

Shrubs or *small trees* 3-4 m tall, either single-stemmed or with up to c. 6 main trunks arising from ground level, main trunks and branches with an ascending aspect, crowns normally rather dense and bushy. *Bark* fibrous and longitudinally fissured on main trunks but smooth on branches and branchlets, grey except on branchlets which are light brown or red-brown. *Branchlets* terete, very obscurely nerved, not resin-ribbed, glabrous. *New shoots* glabrous, resinous when very young. *Stipules* deciduous. *Phyllodes* filiform, 14-18 cm long, c. 1 mm diam., terete, ascending, not rigid, slightly curved to very shallowly serpentinous, pale subglaucous,

* Subtropical is used here in a climatological sense (see Maslin and Hopper, in press).

glabrous except on upper side of the pulvinus at its extreme base which is densely minutely villous, uniformly longitudinally multistriate; narrowed at apices into normally delicately hooked, light brown, non-pungent points; *pulvinus* c. 3 mm long, orange, wrinkled; *gland* situated on upper surface of phyllode at distal end of pulvinus, very indistinct, submerged, phyllode lamina normally very slightly swollen about the gland. *Inflorescences* normally twinned and with a new shoot developing from within the axil, the subtending phyllode often deciduous by the fruiting stage. *Spikes* light golden, 1-2 cm long, flowers somewhat distant; *bracteoles* minute (c. 0.3 mm long), puberulous, claws oblong, laminae inflexed. *Peduncles* 10-13 mm long, glabrous, base ebracteate at anthesis. *Flowers* 5-merous. *Calyx* cupular, 1/4-1/3 the length of the corolla, membranous, sinuate-toothed with widely triangular non-thickened lobes, white-villous. *Petals* 1.5-2 mm long, glabrous, very obscurely 1-nerved. *Legumes* (slightly immature) narrowly oblong, to 7 cm long, 4-5 mm wide, firmly chartaceous, gently curved, flat but slightly raised over the seeds, glabrous, greyish brown; *margins* constricted between the seeds. *Seeds* (slightly immature) longitudinally positioned in the legume, obloid-ellipsoid, 4-4.5 mm long, 2.5 mm wide, compressed, dark brown but with a yellow central portion, not shiny; *pleurogram* "u"-shaped, open towards the hilum; *areole* c. 0.6 mm long and 0.4 mm wide; *funicle* much convoluted, flattened, membranous, whitish, imperceptibly passing into the *aril*.

Other collections examined. WESTERN AUSTRALIA: Tom Price, 0.8 km from minesite entrance, *K. Atkins* 1221 (CANB, K, PERTH); Marra Mamba area, Fortescue River, Hamersley Range, *J. V. Blockley* 291 (PERTH); Hamersley Ranges, 22°40'S, 117°43'E, *M. Cole* WA5097 (PERTH); 27 km from Tom Price on the road to Paraburdoo, *B. R. Maslin* 4666 (BRI, CANB, K, MEL, NY, PERTH, WAIT); 20 km S of Tom Price-Dampier rail crossing on the Wittenoom-Nanutarra road, *B. R. Maslin* 4672 (PERTH); Hamersley Range National Park, 4.8 km from Milli Milli Springs towards Coppin Pool, *M. E. Trudgen* 2407 (BM, G. NT, P, PERTH); Hamersley Range National Park, 1.4 km south-west of hut at Coppin Pool, *M. E. Trudgen* 2548 (AD, BRI, NSW, PERTH).

Distribution. (Figure 11) North-west Western Australia in the Fortescue Botanical District. (1:250 000 map F50-11). Known only from a restricted area of the Hamersley Range from Hamersley Station (22°17'S, 117°41'E) south-east to Coppin Pool (22°53'S, 118°08'E).

Habitat. Low, undulating, rocky hills in ferruginous soil derived from the Marra Mamba and Brockman Iron Formations (de la Hunty, 1965). Some of the species recorded in association with *A. exilis* include *A. aneura*, *A. maitlandii*, *A. spondylophylla*, *Burtonia polyzga*, *Calytrix longifolia* and *Goodenia scaevolina*. The ground cover is dominated by species of 'spinifex' (*Triodia* sp.)

Flowering and fruiting periods. Flowers from May to July; legumes with near-mature seeds have been collected in late September.

Acacia exilis is placed in section Juliflorae (Benth.) Maiden et Betche and is most closely allied to the widespread and zone-subtropical* species *A. tenuissima* F. Muell. (W.A., N.T., Qld.). Although both species occur in the Hamersley Range they have not been observed to grow sympatrically. *Acacia exilis* is distinguished from *A. tenuissima* by its branchlet apices which are not resin-ribbed, its normally longer phyllodes (14-18 cm compared with 6-15 cm), its longer spikes (10-20 mm compared with 5-10 mm) which are a light golden colour (paler yellow in *A. tenuissima*) and

* Subtropical is used here in a climatological sense (see Maslin and Hopper, in press).

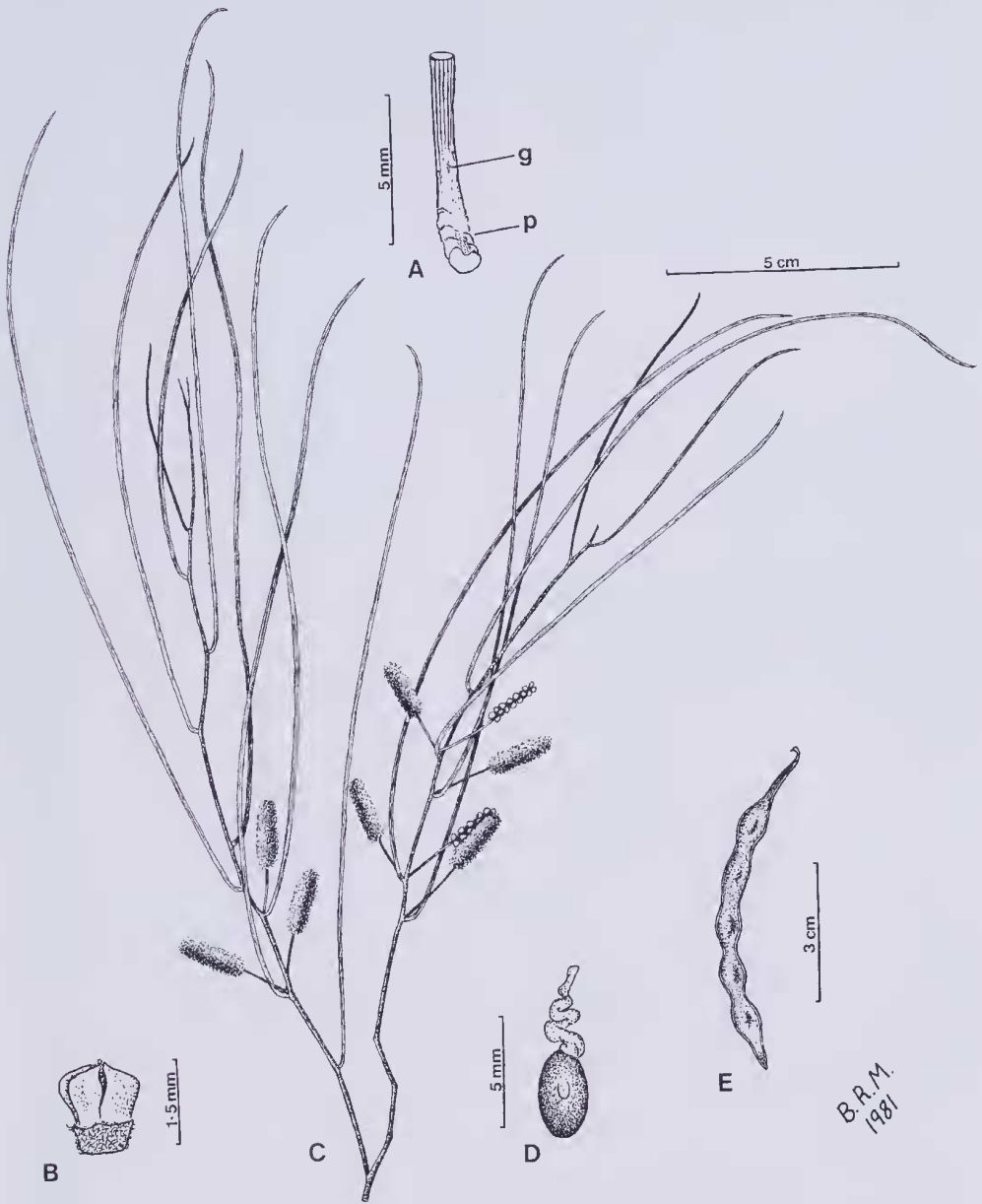


Figure 7. *Acacia exilis*. A—Phyllode base showing gland (g) and pulvinus (p). B—Flower. C—Portion of branch. D—Seed. E—Legume (slightly immature).

A from J. V. Blockley 291; B from M. E. Trudgen 2413 (the type); C from B. R. Maslin 4666; D, E from M. Cole WA5097.

which possess flowers that are less densely arranged, its broader legumes (4-5 mm compared with 2-3 mm) and its whitish funicle-aril (funicle-aril drying yellow in *A. tenuissima*). Although *A. tenuissima* can reach 4 m tall (Pedley, 1978), in the Hamersley Range it is generally a shrub not exceeding about 2 m in height. *Acacia exilis* on the other hand is a taller shrub or small tree up to 4 m high. In the field, flowering plants of *A. exilis* may superficially resemble *A. aneura* F. Muell. ex Benth. (the two species occur sympatrically in places), however, the new species is readily distinguished by its longer, lighter green phyllodes (grey-green in *A. aneura*), by its less dense flower-heads and by its long, narrow legumes.

The specific epithet refers to the slender, lax phyllodes.

8. *Acacia hamersleyensis* Maslin, sp. nov. (Figure 8)

Acacia tumida F. Muell. ex Benth., *A. citrinoviridis* Tindale et Maslin et *A. xiphophylla* E. Pritzel affinis sed combinatione characterum secundarum distinguenda: phyllodiis plerumque leviter falcatis 8-14 cm longis, 1-1.5(2) cm latis, demum glabris, manifeste subtiliter nervatis; inflorescentiis axillaribus (non racemosis); spicis densis, 3-6 cm longis, 6-8 mm latis; leguminibus breviter pilosis, planis, non rugosis differt.

Typus: Rhodes Ridge, Hamersley Range, $\pm 23^{\circ}06'S$, $119^{\circ}25'E$, Western Australia. 10 Aug. 1973. *M. E. Trudgen* 391. "A bush 2.5 m tall. Bark on lower stems silver-grey and somewhat fissured, higher up bark is grey-brown. Older phyllodes slightly glaucous, others medium green. Quite common on stony ground just above small breakaway on the south side of a ridge (forming a thicket at top of ridge)." (holo: PERTH; iso: CANB, K).

Spreading, open shrubby trees 3.5-4 m tall, often rather slender and with a wispy aspect when young, single-stemmed or sparingly branched at ground level (with up to 6 spreading-erect stems when young). *Bark* grey, normally fibrous and fissured on main stems especially near their base, smooth on branches. *New shoots* very pale citron-sericeous when very young. *Branchlets* terete but angular towards the apices, finely ribbed, marked with distant scars of fallen phyllodes, glabrous or sometimes glabrescent towards the apices, sometimes pruinose. *Stipules* deciduous. *Phyllodes* normally slightly falcate and tapered equally at both ends, slightly asymmetric with the upper margin more convex than the lower margin, 8-14 cm long, 1-1.5(2) cm wide, length to width ratio 6-12, coriaceous, normally spreading, glabrous except when young, subglaucous to distinctly glaucescent, light green when young, the acuminate apices narrowing to blunt callose points which are slightly hooked; longitudinal nerves numerous, very fine and close together, neither anastomosing nor basally confluent, c. 3 nerves yellowish and slightly more evident than the rest, marginal nerve discrete and yellowish; *pulvinus* distinct, 5-10 mm long, conspicuously wrinkled, normally glabrous, light orange, depressed and slightly dilated at the base; *gland* situated on the upper margin of the phyllode at the distal end of the pulvinus, lamina slightly swollen about the gland, submerged, comprising a circular or oblong pore (0.3-0.6 mm long) and a very obscure rim. *Inflorescences* simple and axillary but often falsely racemose at the ends of the branches due to phyllode reduction, 1-2 per node, clustered at ends of branches. *Peduncles* 4-10 mm long, thick, longitudinally wrinkled, \pm sparsely puberulous, base ebracteate at anthesis. *Receptacle* sparsely resinous-papillose. *Spikes* bright medium golden, 3-6 cm long, 6-8 mm wide, flowers

densely arranged; *bracteoles* linear-spathulate, c. 1 mm long, densely villous, lamina inflexed. *Flowers* 5-merous. *Calyx* 1/2-2/3 length of corolla, divided for 1/3-2/3 its length into oblong lobes which are apically thickened and yellowish, calyx tube obscurely 5-nerved and normally brownish, white-villous (indumentum often dense). *Petals* 2.5 mm long, connate for c. 1/2 their length, glabrous or glabrescent, obscurely 1-nerved. *Legumes* often clustered on receptacles, narrowly oblong, to 8 cm long, 5-8 mm wide, firmly chartaceous, slightly undulate, slightly resinous, raised over the seeds, very obscurely reticulate, shortly pilose (hairs pale golden when young but whitish at maturity), medium brown, abruptly narrowed at apex, basal stipe 3-7 mm long; *margins* thickened, yellowish or light brown, not (or sometimes slightly) constricted between the seeds. *Seeds* obliquely placed in the legume, obloid to ellipsoid, 4-4.5 mm long, 2.5-3.5 mm wide, slightly compressed (c. 2 mm thick), light greyish brown with pale coloured tissue surrounding the areole, reasonably shiny; *pleurogram* obscure, continuous or "u"-shaped and open towards the hilum; *areole* minute, 0.2-0.5 mm wide; *funicle* filiform, expanded into a very pale yellow fleshy folded *aril* positioned on top of the seed.

Other collections examined. WESTERN AUSTRALIA: Tom Price townsite, *K. Atkins* 445 (PERTH); Upper slopes of Mt Nameless, Tom Price, *K. Atkins* 1225 (K, PERTH) and 1240 (MEL, PERTH); Above Devil's staircase, 22°15'S, 118°20'E, *J. V. Blockley* 378 (KP); Hamersley Ranges, 22°30'S, 117°43'E, *M. Cole* WA5006 (PERTH); Marandoo Ridge (first ridge S of Mt Bruce), Hamersley Range, *C. Dawe* M112 (PERTH, TLF, WAIT); Creek crossing on main Marandoo-Tom Price road, c. 4 km N of Marandoo and immediately west of Mount Bruce, *C. G. Dawe* 218 (CANB, PERTH); Mount Whaleback, Newman, *B. R. Maslin* 4586 (PERTH, WAIT); Rhodes Ridge, 53.5 km NW of Newman on the road to Juna Downs, *B. R. Maslin* 4609 (PERTH); 89 km NW of Newman on the road to Juna Downs, *B. R. Maslin* 4621 (PERTH); Wittenoom Gorge, 4 km S of Wittenoom township, *B. R. Maslin* 4630 (PERTH); Dales Gorge Lookout, Hamersley Range, *B. R. Maslin* 4646 (PERTH); Top of Hancock Gorge, Hamersley Range, *B. R. Maslin* 4677 (PERTH); 4 km N of Marandoo (just S of Mt Bruce) on the road to Tom Price, *B. R. Maslin* 4683 (BRI, NSW, NY, PERTH); In gully near base of south side of Mount Bruce, Hamersley Range, 22°37'S, 118°07'E, *M. E. Trudgen* 327; Rhodes Ridge, Hamersley Range, *M. E. Trudgen* 391 (PERTH); An unnamed gorge in the Hamersley Range, ± 22°25'S, 118°00'E, *M. E. Trudgen* 1042 (PERTH); Marandoo Ridge, Hamersley Range, ± 22°40'S, 118°09'E, *M. E. Trudgen* 1045 (PERTH); "Manganese" gully, Marandoo Ridge, Hamersley Range, ± 22°40'S, 118°09'E, *M. E. Trudgen* 1151 (MEL, PERTH); Hamersley Range National Park, Marandoo Ridge (first ridge south of Mt Bruce) on south side, 200 m east of "Grimace Gulch", *M. E. Trudgen* 2263 (CANB, PERTH); Mount Whaleback, Newman, *K. Walker* 95 (CBG, MEL, NSW, PERTH), 96 (PERTH) and 97 (PERTH); Ophthalmia Range, 23°39'S, 119°43'E, *K. Walker* 113 (PERTH); Hamersley Range National Park, SW declivities of Mount Bruce at c. 3 500 ft. alt., 17 Aug. 1974, *J. H. Willis* s.n. (PERTH-dup. of MEL 503366).

Distribution. (Figure 11) North-west Western Australia in the Fortescue Botanical District (1:250 000 maps F50-11, 12, 16). Known only from the Hamersley Range area where it extends from Mount Newman (23°16'S, 119°34'E) west to Paraburdoo (23°12'S, 117°40'E) and north to the vicinity of Mount Brockman (22°28'S, 117°18'E).

Habitat. Seems restricted to ferruginous soils where it normally grows on the ridges and the upper slopes of ranges. It not uncommonly forms groves, especially along watercourses leading from the ranges. Along the high ridges *A. hamersleyensis*



Figure 8. *Acacia hamersleyensis*. A—Portion of branch. B—Flower. C—Seed. D—Legume (side and plane views). A from M. E. Trudgen 391 (the type); B from B. R. Maslin 4630; C, D from C. G. Dawe 218.

frequently assumes a spindly habit and can be seen in places e.g. Mount Newman, Wittenoom Gorge, to form a wispy band silhouetted against the sky. The species grows in "spinifex" country e.g. *Plectrachne schinzii*, *Triodia pungens*, *T. lanigera* and *T. wiseana* in association with other *Acacia* species e.g. *A. aneura*, *A. pruinocarpa*, *A. maitlandii* and *Eucalyptus* species e.g. *Eucalyptus gamophylla*, *E. leucophloia* and *E. dichromophloia*.

Flowering and fruiting period. Flowering commences in July and extends until about late August. Legumes with mature seeds have been collected from late September to early November.

Acacia hamersleyensis belongs to section Juliflorae (Benth.) Maiden et Betche and appears to have affinities with the more widely distributed species *A. tumida* F. Muell. ex Benth., *A. citrinoviridis* Tindale et Maslin and *A. xiphophylla* E. Pritzel.

Acacia tumida is common in tropical/subtropical W.A. and N.T. but in the Hamersley Range area it is relatively uncommon and, unlike *A. hamersleyensis* is mainly confined to watercourses. Both this species and *A. hamersleyensis* are tall shrubs or small trees with long spicate inflorescences, with glabrous, sometimes pruinose mature branchlets, and with large, glabrous, sometimes glaucescent, multistriate phyllodes which are tapered equally at both ends. *Acacia hamersleyensis* is distinguished from *A. tumida* by its often narrower, less conspicuously falcate phyllodes, its axillary (not racemose), broader spikes and by its non-wrinkled, shortly pilose legumes.

Acacia citrinoviridis ("river jam"), is also normally restricted to watercourses. Compared with *A. hamersleyensis* it is a taller, more graceful tree (to 8 m) which seemingly flowers mainly between April and July. *Acacia citrinoviridis* has generally narrower, more falcate phyllodes which have an appressed, citron or silvery indumentum until intermediate age (indumentum very quickly lost in *A. hamersleyensis*), it has densely golden puberulous peduncles and receptacles and densely appressed (not patent), citron or silvery sericeous young legumes.

Acacia xiphophylla ("snakewood") and *A. hamersleyensis* are small spreading trees (although more gnarled in the former species) with long, spicate inflorescences and with phyllodes of a similar shape and size. *Acacia xiphophylla* occurs on low lying alluvial flats and flowers mainly between September and February. Morphologically *A. hamersleyensis* is distinguished from *A. xiphophylla* by its more obviously nerved phyllodes (observe at x10 mag.), its dense spikes, its larger, more deeply divided calyx which is never golden puberulous, its smaller, pilose legumes and its smaller, less compressed, oblique seeds. In *A. xiphophylla* the legumes are glabrous and can reach 21 cm long and are 1-1.5 cm wide, its longitudinally arranged seeds are 9-11 mm long, 7-10 mm wide, almost orbicular and are distinctly flattened. Although both species have yellow sericeous new shoots when first initiated, in *A. hamersleyensis* these quickly pass to glabrous bright green young phyllodes which in turn become subglaucous to distinctly glaucescent. In *A. xiphophylla* on the other hand the sericeous indumentum turns silver and persists for a considerable time, the mature phyllodes tend to be more coriaceous and never distinctly glaucescent.

The specific epithet refers to the fact that the species is known only from the Hamersley Range area.

9. *Acacia marramamba* Maslin, sp. nov. (Figure 9)

Acacia inaequilatera Domin affinis a qua cortice fibrosa; remulis non-pruinosis, phyllodiis 2-4 cm longis, 1-2 cm latis, vix undulatis, pallide-viridis vel subglaucis, obscure reticulatis, axibus racemorum pedunculisque rubiginosis, legumis leviter arcuatis, funiculo brevissimo differt.

Typus: Marandoo Ridge (first ridge south of Mount Bruce), Hamersley Range, $\pm 22^{\circ}40'S$, $118^{\circ}09'E$, Western Australia. 24 June, 1975. *Malcolm Trudgen* 1338. "A dense bush 2-2½ metres high, fairly spreading. Bark grey-brown, smooth, dull. Branchlets red, flower stalks red, leaves dull whitish green. Growing with *Triodia* and other *Acacia* species in stony red loam." (holo: PERTH; iso: CANB, K).

Spreading *shrubby trees* 2-3 (5) m tall, becoming \pm gnarled and straggly with age, trunks sparingly divided near ground level. *Bark* not corky, fibrous and slightly fissured at base of main trunks otherwise smooth, grey on trunks and branches but red-brown, light brown or orange on branchlets. *Branchlets* terete, finely ribbed, marked with raised scars of fallen phyllodes, glabrous, not pruinose. *Stipules* indurate, spinescent, 2-4(7) mm long, patent, straight, brown, often absent from some nodes especially with age. *Phyllodes* asymmetrically elliptic, very unequal-sided with the upper margin longer and much more convex than the lower, 2-4 cm long, 1-2 cm wide, length to width ratio 1.2-3, coriaceous, barely undulate, glabrous, pale green to subglaucous, not conspicuously pruinose, \pm abruptly acuminate and ending in a straight sharp brown point 1-3 mm long, narrowed towards the base, margins yellowish; principal *nerve* situated near lower margin, raised, yellowish, lateral nerves obscure and tardily anastomosing; *pulvinus* c. 1 mm long, wrinkled, slightly dilated at base, brownish; *gland* situated on upper margin of phyllode at distal end of the pulvinus or up to 1 mm above it, oblong, c. 0.8 mm long, lip yellow and very slightly raised, lacking a distinct central orifice. *Racemes* acropetalous, 1-2 per node, greatly exceeding the phyllodes, 6-15 cm long, concentrated towards the ends of the branches, the axes together with the peduncles glabrous and red-brown. *Peduncles* twinned along raceme axes, 1-2 cm long, base ebracteate and very slightly dilated. *Flower-heads* globular, light to medium golden, the red-brown petals often visible through the stamens in the centre of the heads at anthesis, 25-35-flowered; *bracteoles* linear-spathulate, c. 1 mm long, glabrescent. *Flowers* 5-merous. *Sepals* united at their extreme base, linear-spathulate, c. 1/2 length of petals, glabrous, apically light brown otherwise normally colourless. *Petals* 1.5-2.5 mm long, connate for c. 2/3 their length, the free portion red-brown, glabrous. *Legumes* narrowly oblong, to 7.5 cm long, 7-8 mm wide, \pm chartaceous, slightly curved, slightly undulate, raised over seeds (umbo wrinkled), glabrous, slightly shiny, light brown (yellow-brown prior to maturity); *margins* narrow, barely constricted between the seeds. *Seeds* mostly oblique in the legume although some may be longitudinal, widely ellipsoid to almost orbicular, 4.5-5 mm long, c. 4 mm wide, slightly compressed, black, dull; *pleurogram* very obscure, represented by a shallowly curved line c. 0.5 mm long which is situated near the top of the seed; *funicle* thickly filiform, expanded into a clavate *aril* which extends down about 1/4 the length of the seed.

Other collections examined. WESTERN AUSTRALIA: Northern end of the Mount Beasley group of mountains, S of Mt. Beasley itself, between Meekatharra and Mount Labouchere on the road to Mount Augustus, 2 May 1981, *M. I. Blackwell* 10 (PERTH); Hamersley Range, (Mt.) Brockman, $22^{\circ}32'S$, $117^{\circ}14'E$, *M. Cole* WA5068 (PERTH); Rhodes Ridge, 53.5 km NW of Newman on the road to Juna Downs, *B. R. Maslin* 4610 (K, MEL, NY, PERTH, WAIT); Paraburdo, *B. R. Maslin* 4660

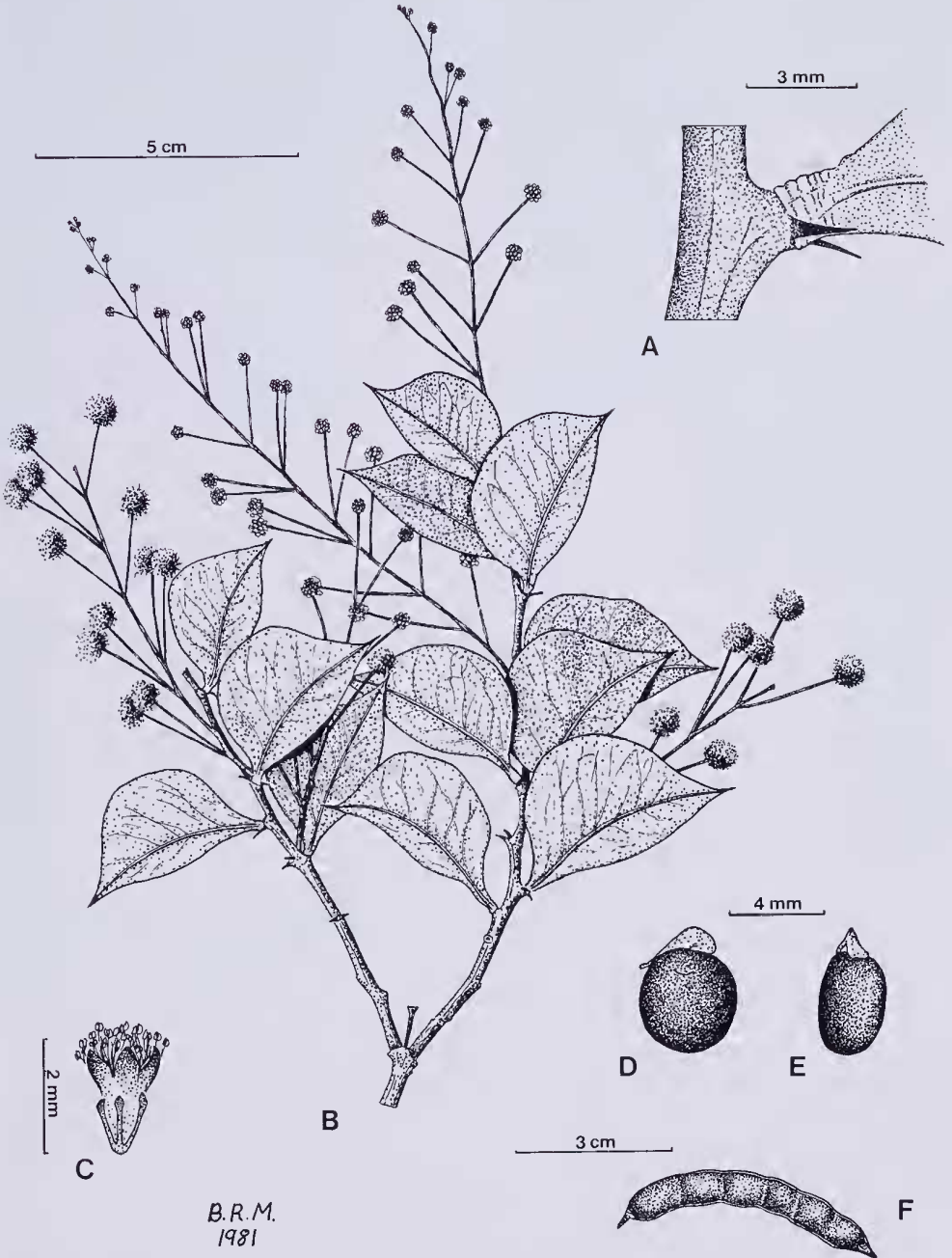


Figure 9. *Acacia marramamba*. A—Node showing spiny stipules and phyllode base. B—Portion of branch. C—Flower. D and E—Seed (D—plane view; E—side view). F—Legume.

A from M. E. Trudgen 2576; B from M. E. Trudgen 2631; C from M. E. Trudgen 1338 (the type); D-F from A. A. Mitchell 269.

(PERTH); 16 km S of Kumarina Hotel on Great Northern Highway, *B. R. Maslin* 4965 (PERTH); 50 km N of Mt Vernon Hst. and S of Mininer Stn., *A. A. Mitchell* 76/186 (PERTH); 50 km N of Tangadie Station, *A. A. Mitchell* 269 (CANB, PERTH); 20 km E of Prairie Downs Hst., Upper Ashburton, *A. A. Mitchell* 341 (PERTH); Marandoo Ridge, Hamersley Range, $\pm 22^{\circ}40'S, 118^{\circ}09'E$, *M. E. Trudgen* 1049 (PERTH); Hamersley Range National Park, 4.6 mi (7.5 km) south on track to Turee Creek from the Juna Downs to Coppin Pool track, *M. E. Trudgen* 2576 (NSW, PERTH); Hamersley Range National Park, small unnamed hill on the north side of Mount Trevarton, *M. E. Trudgen* 2631 (BM, BRI, PERTH).

Distribution. (Figure 11) North-west Western Australia in the Fortescue and northern Ashburton Botanical Districts (1:250 000 maps F50-11, 15, 16; G50-4, 8). Most collections are from the Hamersley Range area from about Mount Brockman ($22^{\circ}28'S, 117^{\circ}18'E$) east to Rhodes Ridge ($23^{\circ}05'S, 119^{\circ}22'E$), however, the species does extend south into the Ashburton River basin. Although not forming locally dense populations, the species is not uncommon throughout its area of distribution.

Habitat. In the Hamersley Range area the species grows on low hills the rocks of which normally belong to the Marra Mamba Iron Formation (Macleod, 1966). Soils are skeletal and comprise highly ferruginous red-brown loam. The associated vegetation is *Acacia* shrubland e.g. *A. aneura*, *A. pruinocarpa*, *A. maitlandii*, *A. stowardii*, with a *Triodia wiseana* ground cover.

Flowering and fruiting period. Flowers from May to July. Legumes with immature seeds have been collected in late August. It is probable that these seeds would have reached maturity by about late September.

Acacia marramamba belongs to Sect. Phyllodineae DC. and is mostly closely allied to the Western Australia—Northern Territory arid zone species *A. inaequilatera* Domin. Both these taxa are small trees with spiny stipules, distinctly asymmetric, pungent phyllodes and long terminal racemes with brightly coloured axes. Although the two species sometimes occur sympatrically in the Hamersley Range, *A. marramamba* is readily distinguished by its smooth or fibrous (not corky) bark, its non-pruinose branchlets, its normally smaller, less undulate, pale green to subglaucous phyllodes with their very obscure lateral venation (phyllodes in *A. inaequilatera* are 2.5-7 cm long, 1.5-3.5 cm wide, often grey-green, and always with a prominent reticulum), its red-brown raceme axes and peduncles (not purple), its slightly curved legumes (not circinate) and its funicle which does not encircle the seeds.

The specific epithet refers to the Marra Mamba Iron Formation on which the species is frequently found.

10. *Acacia pyrifolia* DC., Prodr. 2: 452 (1925). *Type:* Nouvelle Hollande, cote Orient, Mus. de Paris 1821 (holo: G-DC; iso: K, P).

Acacia clementii Domin, Biblioth. Bot. 89: 812 (1926), non Maiden et Blakely (1928) syn. nov. *Lectotype* (here selected): N.W. Australia. Between the Ashburton and De Grey rivers. *E. Clement* s.n. (PR527758—right hand specimen on the sheet; iso: K, PR—left hand specimen on sheet no. 527758). *Lectoparatypes:* (1) Western Australia: Between the Ashburton and Yule Rivers. *E. Clement* (K—vegetative specimens on the sheet are *A. pyrifolia*, seeds are those of *A. inaequilatera*); (2) Bay of Rest, Dampier's Archipelago, Feb. 1818, *A. Cunningham* s.n. (K).

The name *A. clementii* Domin was based on three collections. The species was distinguished from *A. pyrifolia* by its coriaceous phyllodes and by its funicles which completely encircle the seeds. I have examined the holotype of *A. pyrifolia* and also all syntypes of *A. clementii* and can detect no substantial differences between them. Although *A. pyrifolia* in the broad sense (here I would include *A. morrisonii* Domin) does exhibit some phyllode textural variability (i.e. some can be more coriaceous than others) this is not a significant or diagnostic taxonomic character. The seeds which Domin described under *A. clementii* are at Kew and are included in a packet with the Clement (sterile) specimens collected from between the Ashburton and Yule rivers. The vegetative material on this sheet readily falls within the natural range of variation for *A. pyrifolia*. In the seed packet, besides the seeds themselves, are loose phyllodes some of which are referable to *A. inaequilatera* Domin. The seed differences between *A. pyrifolia* and *A. inaequilatera* are based primarily on the length of the funicle which completely encircles the seed in a double fold in *A. inaequilatera* but is much shorter in *A. pyrifolia*. There are some seeds in the above-mentioned packet which have funicles completely encircling them, although on most the funicle has been broken-off. Apparently what has happened is that under the name *A. clementii* Domin described foliage and flowers of *A. pyrifolia* and seeds of his own new species, *A. inaequilatera*.

11. *Acacia stowardii* group

Seven species are currently ascribed to this taxonomically complex species-group viz. *A. adsurgens* Maiden et Blakely, *A. atkinsiana* Maslin, *A. duriuscula* W. V. Fitzg., *A. kempeana* F. Muell. (syn. *A. sibirica* S. Moore), *A. nelsonii* Maslin, *A. rhodophloia* Maslin and *A. stowardii* Maiden (syn. *A. clivicola* Pedley). More than half of these species are wide-ranging arid zone taxa (Maslin and Pedley, in press), and all but *A. duriuscula* and *A. nelsonii* are recorded for the Hamersley Range area. The members of this group are characterized by their non-anastomosing, finely multistriate phyllodes with nerves very close together, their obloid or cylindrical (rarely globular) flower-heads, their gamosepalous, shortly dissected calyxes and their flat, linear to oblong, chartaceous to \pm cartilaginous legumes. Difficulties encountered in distinguishing certain members of the *A. stowardii* group have been noted under *A. atkinsiana* above and also in Maslin (1980) and Pedley (1981). The species are distinguished principally by their phyllode and legume dimensions, their seed orientation and their bark and flower-head characteristics. However, it is evident from both field and herbarium studies that considerable variation exists in certain of these morphological features. Additionally, many of the species superficially resemble one another, especially when viewed on herbarium sheets. For these reasons the following notes are provided as a guide to the variation and as an aid to identification for species from the Hamersley Range area. Undoubtedly more intensive field and laboratory studies are required in order to fully resolve the taxonomic complexities within this group.

11a. *A. adsurgens* Maiden et Blakely

The salient features of the Hamersley Range specimens referred to this species are: Phyllodes narrowly linear, 11-20 cm long, 2-3 mm wide, pale subglaucous, finely multistriate with the central nerve slightly more evident than the other nerves. Spikes pale yellow, flowers densely arranged. Calyx gamosepalous, more than half the length of the corolla. Legumes unknown.

The characters given above accord with those of *A. adsurgens* (see Maslin, 1981), however, legumes from the Hamersley Range populations are required to confirm the identification.

This species is superficially very similar to the long, linear phyllode forms of *A. stowardii* (see below) but can be distinguished by its generally longer and slightly broader phyllodes with a slightly pronounced central nerve, its denser, paler yellow spikes and its slightly longer calyx.

11b. *A. atkinsiana* Maslin

See species no. 2 above.

11c. *A. kempeana* F. Muell. (syn. *A. sibirica*)

This widespread arid zone species is not common in the Hamersley Range area having been recorded only from Marandoo which is situated near the base of Mount Bruce. *Acacia kempeana* is most closely allied to *A. stowardii* from which it is distinguished mainly by its broader phyllodes and legumes and its transverse to obliquely transverse seeds (see key to species above). Pedley (1978) reports that where the ranges of the two species adjoin in north-western Queensland intermediates sometimes occur. Judging from some specimens seen, it seems probable that intermediates between *A. kempeana* and *A. stowardii* also occur within the Hamersley Range area. More intensive field studies (in particular to gather fruiting material) are required in order to gain a clearer understanding of the relationship between these two species in the Hamersleys.

11d. *A. rhodophloia* Maslin

As noted previously (Maslin, 1980) *A. rhodophloia* is a variable species. The Hamersley Range populations of this species possess phyllodes that are narrowly elliptic (often linear elsewhere) and which range from 4.5-6.5 cm long and 5-8 mm wide with a length to width ratio of 6-13. Sometimes *A. stowardii* (see below) has phyllodes similar to this but *A. rhodophloia* is readily distinguished by its "Minni Ritchi" bark (i.e. red and exfoliating in narrow shavings which curl retrorsely from each end) and also by its flower-heads which are broader and with flowers more densely arranged. Additionally, the calyx on *A. rhodophloia* slightly exceeds half the length of the corolla whereas on *A. stowardii* it is as long as, or shorter than, half the corolla. Flowering specimens of *A. rhodophloia* from the Murchison River area may superficially resemble *A. atkinsiana* (see species no. 2 above).

11e. *A. stowardii* Maiden (syn. *A. clivicola* Pedley)

This species is recognized by its grey bark, its finely multistriate phyllodes, its light golden spikes with flowers not densely arranged, its gamosepalous calyx which does not exceed c. 1/2 the length of the corolla, its chartaceous legumes which are from 4-9(10) mm wide and its longitudinal to longitudinally oblique seeds. As noted by Pedley (1978) under *A. clivicola* (= *A. stowardii*), the normal range in phyllode size for this species is from (2)3-6(7) cm long and (0.7)1-3(4) mm wide. *Acacia stowardii* in the Hamersley Range area is very variable with respect to its phyllodes which are often longer and/or broader than normal. In some populations the phyllodes are of a constant size but in others considerable variation has been observed. For example, on the collection *B. R. Maslin* 4605 and 4605A (which is

referable to variant 2 below) from 38 km NW of Newman, the phyllodes varied from 5-7(9) cm long, 2-4(6-7) mm wide and had a length to width ratio of 10-18(22-35). On the basis of phyllode dimensions, two variants of *A. stowardii* from the Hamersley Range area are described below. It is noted, however, that the distinction between these two variants may well be artificial and that future sampling will show a continuum from one to the other.

1. Phyllodes narrowly linear, (6)8-12.5 cm long, 1-2 mm wide, length to width ratio 30-120, uniformly finely multistriate. Of restricted distribution being recorded only from Tom Price, Paraburdoo and Marandoo areas. This variant superficially resembles *A. adsurgens* (see 11a. above for distinguishing characters).

2. Phyllodes broadly linear to very narrowly elliptic, 4.5-9(10-12.5) cm long, 2-8 mm wide, length to width ratio 9-20(25-35). Widespread in the Hamersley Range area and has also been collected from the Rudall River area about 400 km to the east. Broad phyllode individuals may resemble either *A. kempeana* or *A. rhodophloia* (see 11c. and 11d. above). The bark on this variant is grey and is normally fissured near the base of the main trunks. On a few plants, however, the bark on the main trunks, although externally grey, exfoliates in a manner not dissimilar to the "Minni Ritchi" bark of *A. rhodophloia* and reveals a smooth, red underlayer.

12. ***Acacia trachycarpa*** E. Pritzel, Bot. Jb. 35:308 (1904). *Lectotype* (here selected): Harding River, Roebourne, 18 Apr. 1901, *L. Diels* 2755 (PERTH—ex Museo Botanico Berolinensis). *Lectoparatype*: Near Roebourne, April 1901, *E. Pritzel* 279 (B, DBN, E, K, L, M, P, PR). This collection is *A. arida* Benth.

A. gonocarpa var. *lasiocalyx* F. Muell., Plants of North-Western Australia. Part 1: 8 (1881). *Type citation*: "Yule and Fortescue Rivers. Jones' Creek and Georges River, *J. Forrest*" (n.v.).

Acacia trachycarpa is a "Minni Ritchi" species common throughout the Pilbara Region (i.e. Fortescue Botanical District) particularly along creeks and rivers. The original description was based on two syntypes viz. *Diels* 2755 and *Pritzel* 279. The former collection which is in flower has been selected as the lectotype because it accords well with the protologue and because it is representative of the taxon currently understood as *A. trachycarpa*. No specimen of *Diels* 2755 has been located at Berlin (B). The only duplicate of this collection known to me is at PERTH, it therefore has been selected as the type. *Pritzel* 279 is also a flowering collection but it differs from the original description with respect to its phyllodes which are minutely punctulate (not mentioned in the protologue) and nerveless (prominently 1-3-nerved in protologue). *Pritzel* 279 in fact is *A. arida* Benth. No fruiting syntype of *A. trachycarpa* has been located even though legumes were described in the protologue. The carpological description is comprehensive and almost certainly refers to *A. trachycarpa* sensu lectotypico but definitely not to *A. arida*. In view of these facts it is surprising to find in some herbaria e.g. DBN, M and PR, specimens of *Pritzel* 279 originally named *A. arida* but redetermined by Pritzel himself as *A. trachycarpa*.

Acacia gonocarpa var. *lasiocarpa* is queried as a synonym of *A. trachycarpa* mainly because I have not seen the type. The original description, although brief, enables me to be reasonably sure that it was *A. trachycarpa* that was being described. According to Maiden (1917:100) the type is no longer at the National Herbarium, Melbourne (MEL).

13. *Acacia xiphophylla* E.Pritzl, Bot. Jb. 35: 305 (1904). *Lectotype* (here selected): Tree, 4 m in height, 25 km south of Roebourne, 24 April 1901, L. Diels 2808 (PERTH—a single phyllode only, ex Museo Botanico Berlinensis).

Acacia clementii Maiden et Blakely (as 'clementi'), J. Roy. Soc. W. Aust. 13: 26 t.19 ff. 1-4 (1928), nom. illeg., non Domin (1926), *syn. nov.* *Type*: Between the Ashburton and Yule Rivers W.A., 1898, E. Clement (holo: NSW; iso: PERTH—fragment ex NSW).

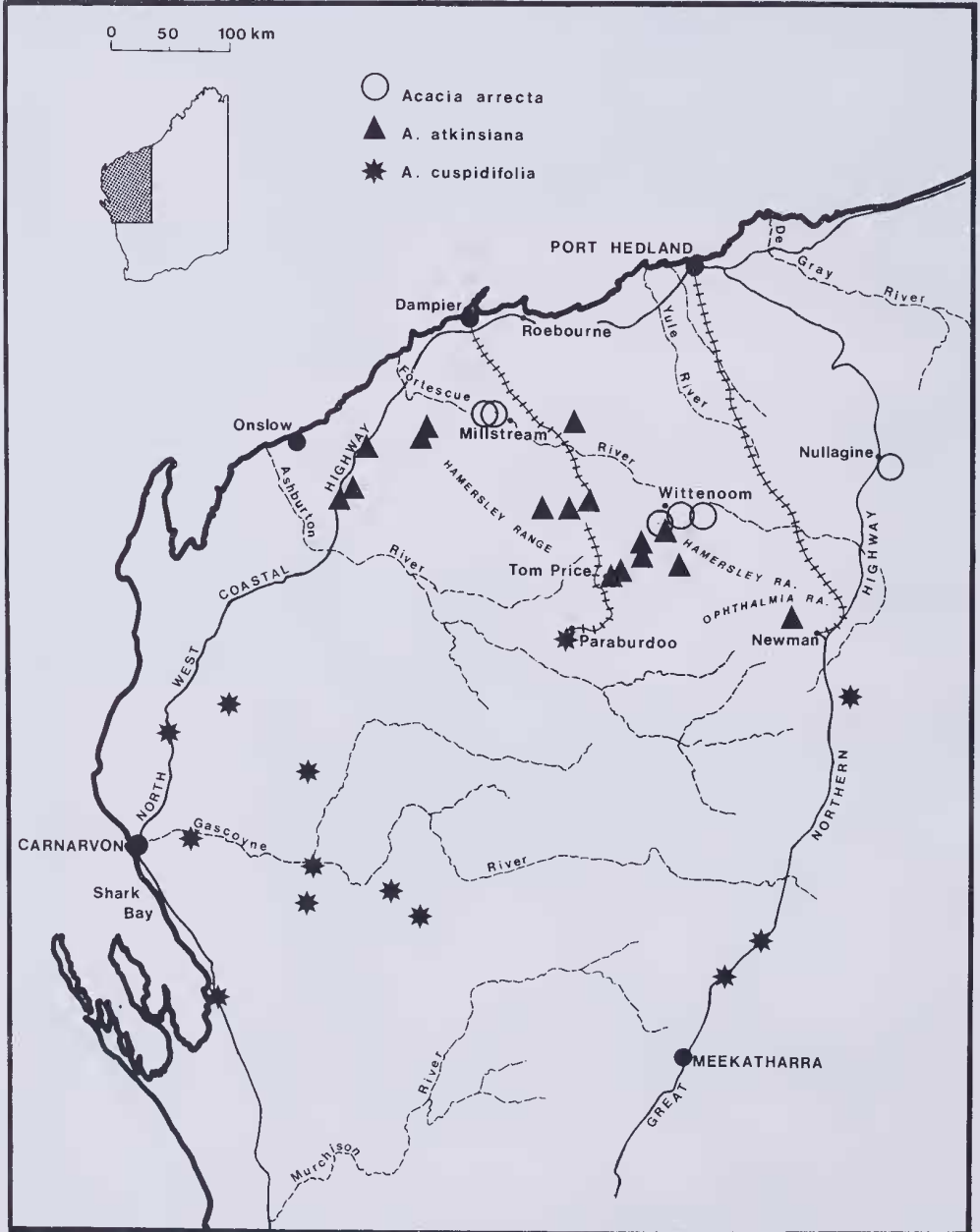


Figure 10. Distribution of *Acacia arrecta*, *A. atkinsiana* and *A. cuspidifolia*

Through the courtesy of the Director, Royal Botanic Garden and National Herbarium, Sydney (NSW) I have inspected Maiden and Blakely's type of *A. clementii* and compared it with the lectotype of *A. xiphophylla* at PERTH. Unfortunately Diels' original gathering of *A. xiphophylla* is not at the Botanisches Museum, Berlin (B) it probably having been destroyed when that institution was burnt in 1943. The PERTH lectotype comprises only a single phyllode but this accords very well with other collections attributed to *A. xiphophylla*. This species is very common around Roebourne (the type locality) and there is no other *Acacia* species known to occur in that area with which it is likely to be confused. The holotype of *A. clementii* Maiden et Blakely comprises the upper portion of a flowering branch and this accords well with other material at PERTH under *A. xiphophylla*. The two taxa are therefore considered conspecific.

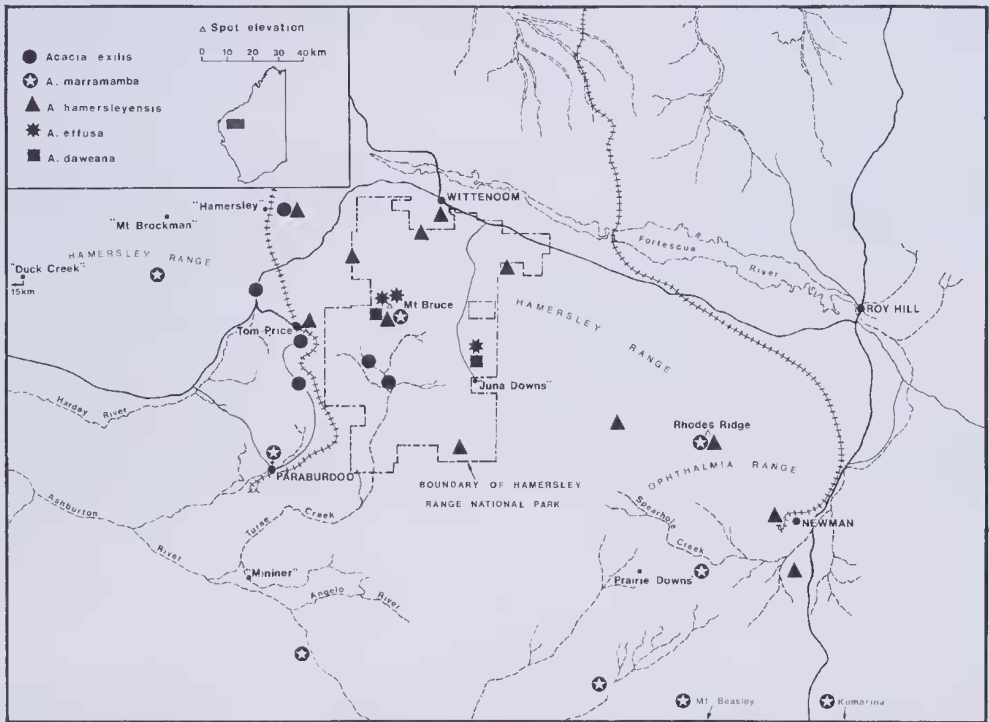


Figure 11. Distribution of *Acacia daweana*, *A. effusa*, *A. exilis*, *A. hamersleyensis* and *A. marramamba*.

Acknowledgements

Many workers have greatly facilitated this project by providing both collections and habit/habitat data for many of the included taxa. In particular I would like to thank Libby Mattiske, Penny Würm and Ken Atkins for material and data from the Tom Price-Paraburdoo area, Chris Dawe (Marandoo area), Ken Walker (Newman area), Ian and Eva Solomon (Wittenoom area) and Malcolm Trudgen (Pilbara area in general). John Fox (W.A. Institute of Technology) is thanked for providing an airfare in 1980. This facilitated botanical collecting in the Hamersley Range National Park during a biological survey sponsored by Ian Pound of Integrated

Environmental Services. Garry Marney is thanked for field assistance and Suzanne Curry for very competent technical help. The project was conducted at the Western Australian Herbarium (PERTH) with financial assistance provided under an Australian Biological Resources Study grant from the Bureau of Flora and Fauna.

Index to specimens studied for new species described herein

This index is arranged alphabetically according to the name of the collector. Numbers in parentheses refer to the corresponding numbered species in the text. Unless otherwise indicated, the specimens cited are housed at the Western Australian Herbarium (PERTH). Abbreviations for herbaria are those given in Index Herbariorum, Part 1, Edition 6 (1974). In the case of Kings Park and Botanic Garden, Murdoch University and the Western Australian Institute of Technology (all in Perth), there are no formal abbreviations so KP, MURD and WAIT respectively are used informally here.

Ashby, A. M. 4491 (4—CANB, K, MEL, PERTH).

Atkins, K. 445 (8), 1209 (2—CANB, PERTH), 1213 (2—K, PERTH), 1221 (7—CANB, K), 1225 (8—K, PERTH), 1240 (8—MEL, PERTH), 1257 (4—Type: CANB, K, NY, PERTH), 1264 (4).

Beard, J. S. 3510 (4—KP, PERTH), 4366 (4), 4569 (2—KP), 4603 (1—KP), 6148 (2).

Black, R. F. s.n. 10 Oct. 1975 (1), s.n. 30 Jan, 1975 (1—NSW, PERTH), s.n. 6 Dec. 1974 (1).

Blackwell, M. I. 10 (9).

Blockley, J. V. 291 (7), 378 (8—KP).

Brooker, M. I. H. 2089a (1—CANB, K, MEL, PERTH).

Cole, M. 5006 (8), 5030 (2), 5067 (2) 5068 (9), 5097 (7).

Dawe, C. G. 008 (6), 210 (5) M112 (8—PERTH, TLF, WAIT), M154 (2—CBG, PERTH), 212 (6—BRI, CANB, K, PERTH), 218 (8—CANB, PERTH).

Dell, B. s.n. 7 June 1979 (2—MURD).

Demarz, H. 611 (4—KP, PERTH), 2778 (4—KP, PERTH), 4416 (1—KP, PERTH), D5755 (2—KP, PERTH), D7084 (2—TLF, PERTH), 7652 (4)

Gardner, C. A. 6152 (4), 6208 (4).

George, A. S. 1068 (1).

Hastings, B. S4356 (2—KP).

Lethbridge, I. L. s.n. July/Aug. 1971 (1—BRI, PERTH).

Maloney, B. 73/53 (2).

Maslin, B. R. 2733 (2—AD, MEL, NSW, PERTH), 2761 (2—B, BM, G, NSW, P, PERTH), 2771 (4) 4586 (8—PERTH, WAIT), 4609 (8), 4610 (9—K, MEL, NY, PERTH, WAIT), 4621 (8), 4627 (6), 4628 (5), 4630 (8), 4644 (1—Type: CANB, K, MEL, PERTH), 4646 (8), 4648 (2), 4653 (4), 4660 (9), 4666 (7—BRI, CANB, K, MEL, NY, PERTH, WAIT), 4672 (7), 4677 (8), 4681 (6—Type: CANB, K, MEL, PERTH), 4682 (5—Type: CANB, K, NY, PERTH), 4683 (8—BRI, NSW, NY, PERTH), 4685 (2—PERTH, WAIT), 4746 (2), 4965 (9), 4996 (4), 5003 (4), 5012 (4).

Mitchell, A. A. 76/186 (9), 269 (9—CANB, PERTH), 341 (9) 348 (1—PERTH, WAIT), 367 (2).

O'Farrell, R. 48 (4).

Pullen, R. 10940 (6—AD, CANB, PERTH).

Stewart, K. s.n. Sept. 1957 (1).

Truagen, M. E. 319 (6—BRI, PERTH), 323 (6), 327 (8), 391 (8—Type: CANB, K, PERTH), 1042 (8) 1045 (8), 1049 (9), 1151 (8—MEL, PERTH), 1299 (2—PERTH, WAIT), 1338 (9—Type: CANB, K, PERTH), 2263 (8—CANB, PERTH), 2407 (7—BM, NT, G, P, PERTH), 2413 (7—Type: CANB, K, MEL, NY, PERTH), 2493 (2—Type: CANB, K, NY, PERTH), 2503 (2—BRI, PERTH), 2548 (7—AD, BRI, NSW, PERTH), 2576 (9—NSW, PERTH), 2631 (9—BM, BRI, PERTH).

Walker, K. 95 (8—CBG, MEL, NSW, PERTH), 96 (8), 97 (8), 113 (8).

Weston, A. S. 10842 (2), 10844A (2).

Willis, J. H. PERTH—Dup. of MEL 503363 (2), MEL 503364 (6—MEL, PERTH), s.n. 17 Aug. 1974 (8)

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